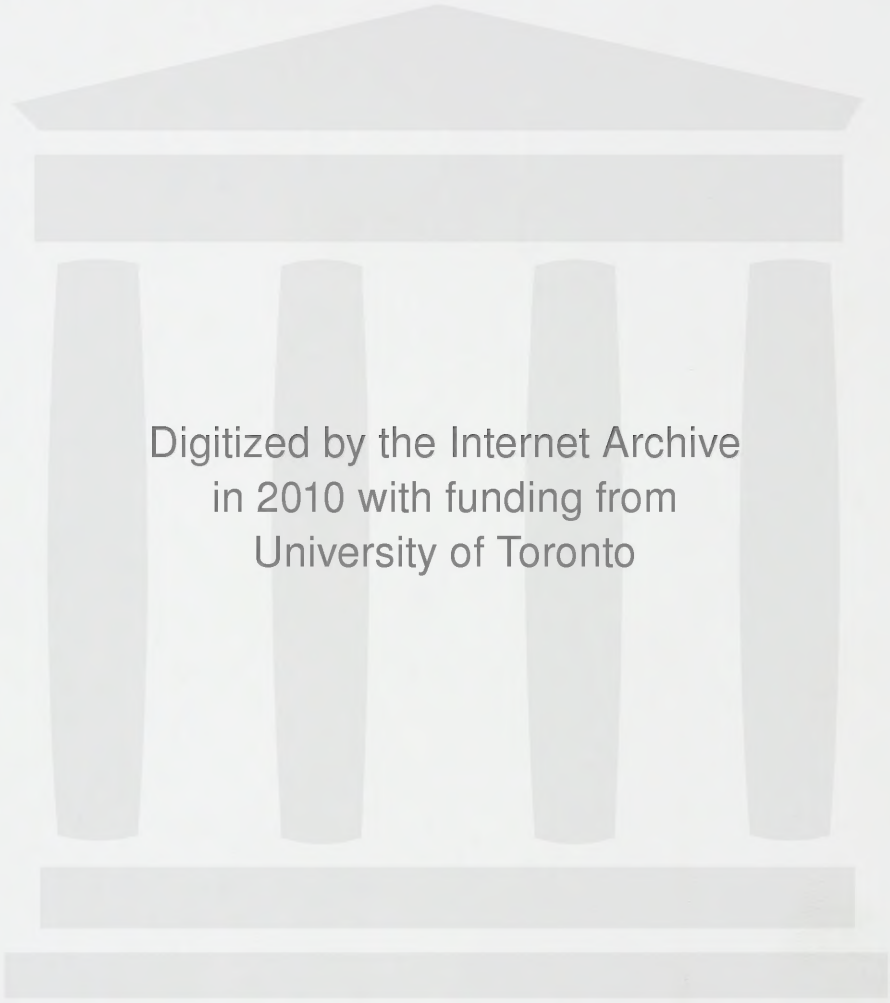
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VOLUME XIV SEPTEMBER 1921 NUMBER 9

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SOUTHERN MEDICAL ASSOCIATION
Fifteenth Annual Meeting, Hot Springs, Arkansas, November 14-17, 1921

TABLE OF CONTENTS

MEDICINE—Internal Diseases, Pediatrics, Neurology, Diagnostic Methods, Etc.

Result of the Diagnostic Study of One Thousand Cases Seen in the Southeast. Stewart R. Roberts, Robert N. Holland and L. B. Robinson, Atlanta, Ga. 665

Discussed by John A. Witherspoon, Nashville, Tenn.; John T. Halsey, New Orleans, La.; Douglas VanderHoof, Richmond, Va.; Graham E. Henson, Jacksonville, Fla.; J. S. McLester, Birmingham, Ala.

Some Observations on the Fractional Analysis of the Gastric Contents. Julius Friedenwald and Zachariah R. Morgan, Baltimore, Md. 671

Discussed by Seale Harris, Birmingham, Ala.; Bryce W. Fontaine, Memphis, Tenn.; J. C. Johnson, Atlanta, Ga.; Harry G. Walcott, Dallas, Tex.

Pellagra. John L. Jelks, Memphis, Tenn. 678

Discussed by J. E. Knighton, Shreveport, La.; George M. Niles, Atlanta, Ga.; John A. Witherspoon, Nashville, Tenn.; Harry G. Walcott, Dallas, Tex.; Homer S. Bruce, Opelika, Ala.; John B. Thielen, Knoxville, Tenn.; Sidney K. Simon, New Orleans, La.; A. L. Levin, New Orleans, La.

A Proposed Standard Treatment for Early Syphilis. George Walker, Baltimore, Md. 683

A Rational Method of Producing Antihuman Amboceptor in Rabbits. George F. Klugh, Atlanta, Ga. 684

Malnutrition in Children of the Well-To-Do: A Review of Case Histories. Charles Gilmore Kerley, Edward J. Lorenze, Jr., and Roger H. DuBose, New York, N. Y. 685

The Endocrine System in Infancy and Early Childhood. Oliver W. Hill, Knoxville, Tenn. 689

Discussed by C. E. Boynton, Atlanta, Ga.; L. R. DeBuys, New Orleans, La.; A. A. Shawkey, Charleston, W. Va.; P. F. Barbour, Louisville, Ky.; Alice Pickett, Louisville, Ky.; W. W. Harper, Selma, Ala.; H. M. Austin, Laredo, Tex.

SURGERY—Railway, Industrial, Gynecological, Obstetrical and Urological

X-Ray and Radium as an Aid to Surgery in Deep-Seated Malignancies. W. O. Floyd, Nashville, Tenn. 697

Concluded on next page

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TABLE OF CONTENTS—Concluded

Radium Therapy in Fibroid and Other Benign Conditions of the Uterus. William Kohlmann and Ernest C. Samuel, New Orleans, La. 703

Papers of Dr. Floyd and Drs. Kohlmann and Samuel discussed by Louis Frank, Louisville, Ky.; H. E. Ashbury, Baltimore, Md.; Richard A. Barr, Nashville, Tenn.; M. F. Bledsoe, Port Arthur, Tex.; F. Webb Griffith, Asheville, N. C.; William D. Haggard, Nashville, Tenn.

Extension Treatment of Fractures. Thomas H. Ingram, Memphis, Tenn. 710

Discussed by E. L. Scott, Birmingham, Ala.; Fred G. Hodgson, Atlanta, Ga.

Factors That Lower the Mortality Rate of Suprapubic Prostatectomy. George R. Livermore, Memphis, Tenn. 713

Discussed by Courtney W. Shropshire, Birmingham, Ala.; H. W. Walther, New Orleans, La.; A. J. Crowell, Charlotte, N. C.; Carl Wheeler, Lexington, Ky.; John R. Caulk, St. Louis, Mo.; E. G. Ballenger, Atlanta, Ga.; Lewis Wine Bremerman, Chicago, Ill.

The Combined Examination of the Urinary Tract by the Urologist and the Roentgenologist. Howard E. Ashbury and Albert E. Goldstein, Baltimore, Md. 719

Discussed by A. L. Gray, Richmond, Va.; T. A. Groover, Washington, D. C.; R. H. Lafferty, Charlotte, N. C.; J. F. Armentrout, Roanoke, Va.

The Nausea and Vomiting of Pregnancy. James R. Garber, Birmingham, Ala. 726

Discussed by Otto Schwarz, St. Louis, Mo.; E. Lee Dorsett, St. Louis, Mo.; George Clark Mosher, Kansas City, Mo.; S. M. Scott, Oakdale, La.; Edward Speidel, Louisville, Ky.; E. C. Cartledge, Atlanta, Ga.

EYE, EAR, NOSE AND THROAT

Eliminative Subjective Testing for Glasses. Chas. A. Bahn, New Orleans, La. 732

Discussed by J. W. Jervey, Greenville, S. C.; Hilliard Wood, Nashville, Tenn.; Milton J. Stern, Paris, Ky.; Oscar Wilkinson, Washington, D. C.; George Maxwell, Roanoke, Va.; C. A. Weiss, Baton Rouge, La.; Hiram Woods, Baltimore, Md.; D. D. McHenry, Oklahoma City, Okla.; J. A. White, Richmond, Va.

An Antrum Operation with Demonstration of New Instruments. E. L. Roberts, Nashville, Tenn. 742

EDITORIALS 744

THE HOT SPRINGS MEETING 752

CORRESPONDENCE 753

BOOK REVIEWS 754

SOUTHERN MEDICAL NEWS 38

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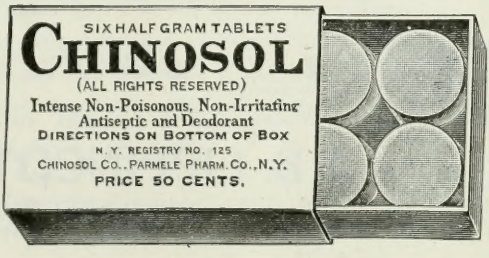

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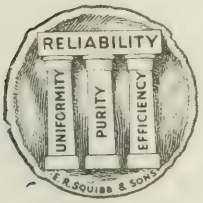

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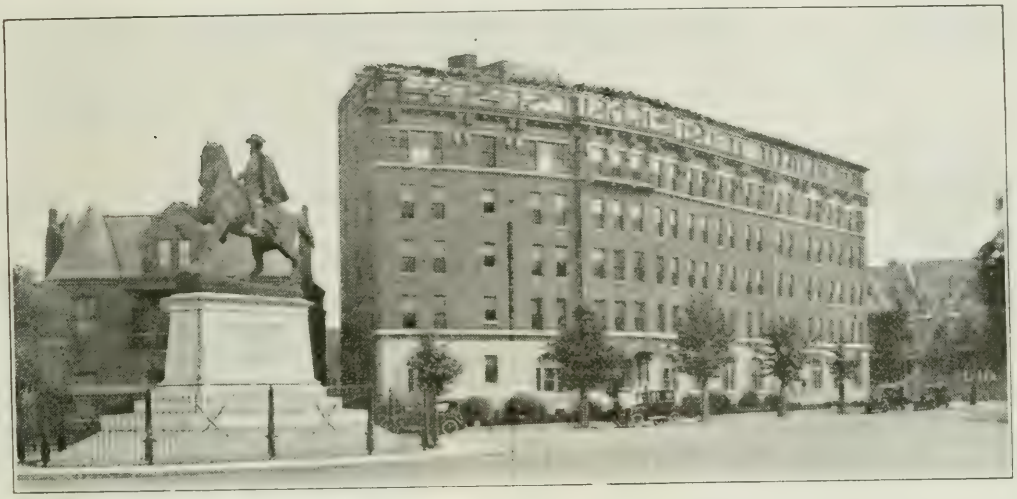

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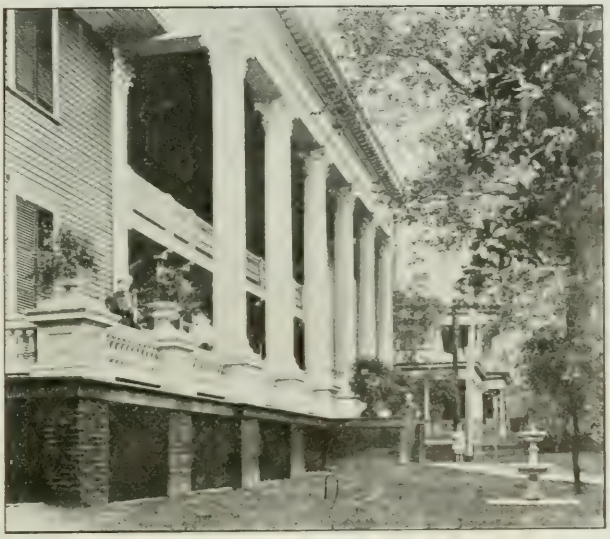

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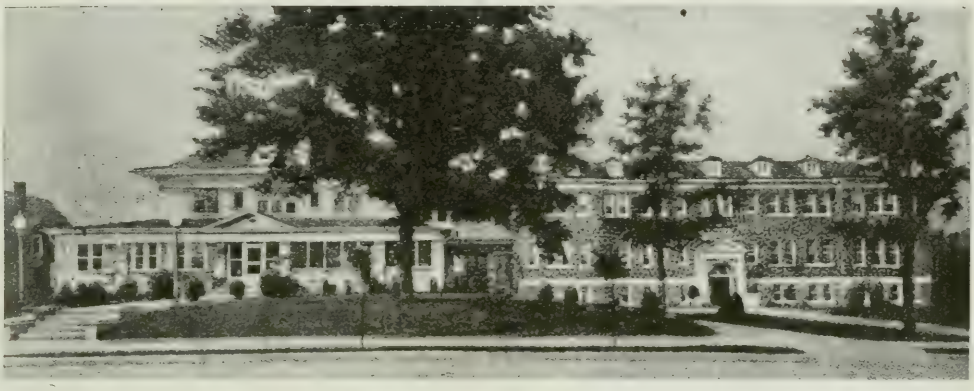

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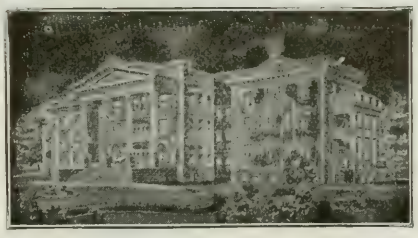

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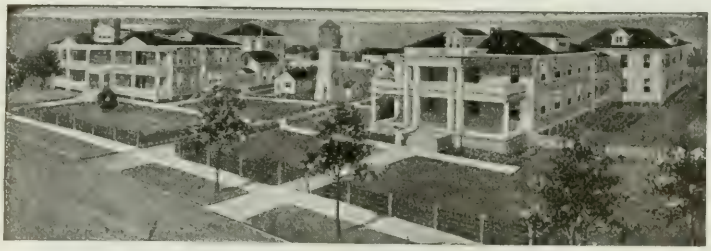

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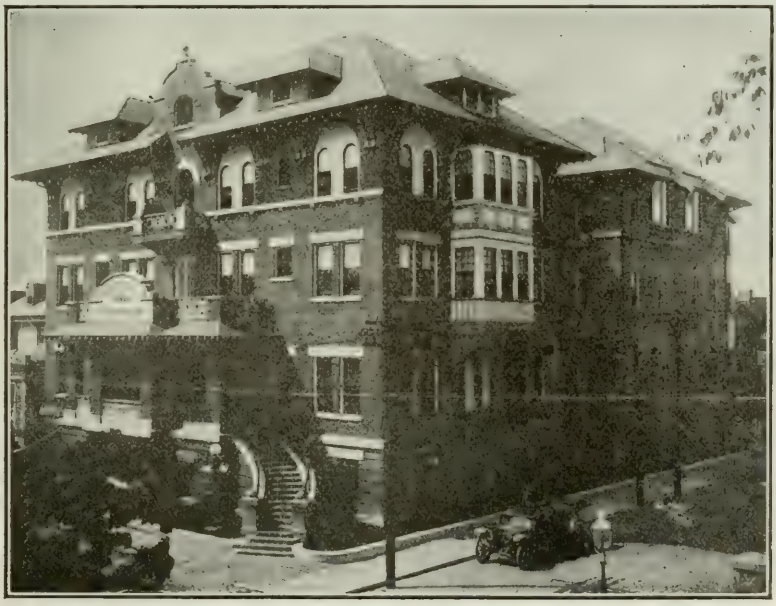

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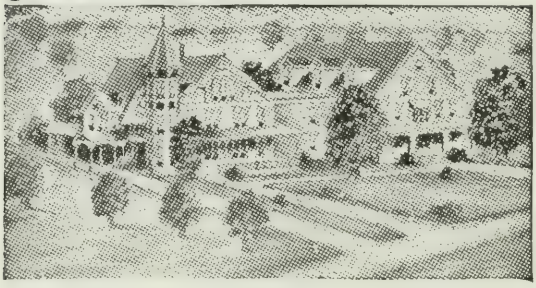

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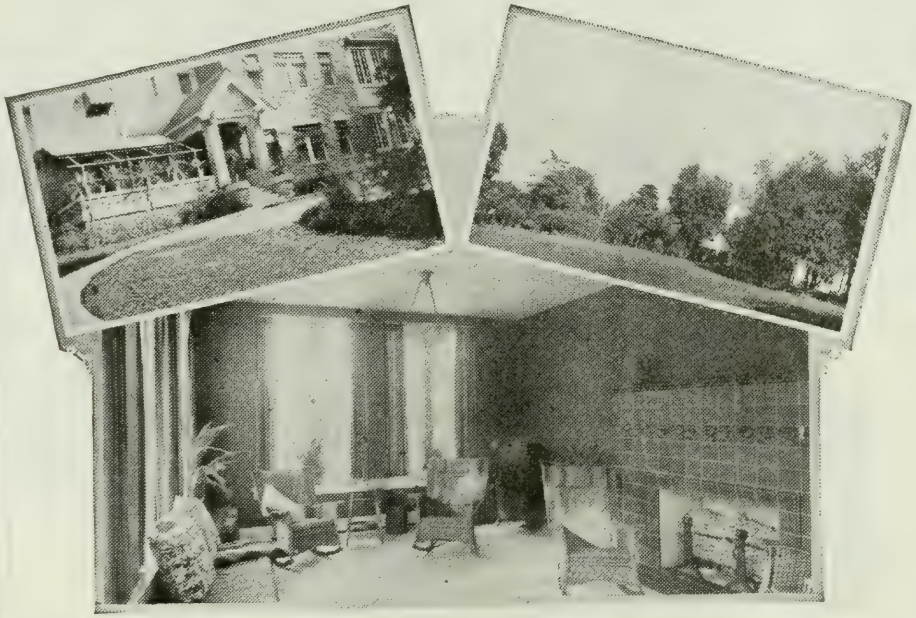

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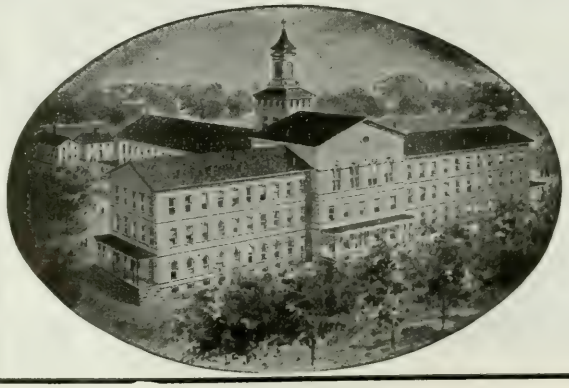

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JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION

PUBLISHED MONTHLY AT BIRMINGHAM, ALABAMA

Volume XIV SEPTEMBER 1921 Number 9

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

RESULT OF THE DIAGNOSTIC STUDY OF ONE THOUSAND CASES SEEN IN THE SOUTH-EAST*

By Stewart R. Roberts, M.D.,
Robert N. Holland, M.D.,
and
L. B. Robinson, M.D.,
Atlanta, Ga.

Since the Frenchman, Louis, used the numerical method in medicine, medical writers have unconsciously imitated his striking example. Seeing numbers of cases we can summarize, classify, present facts and deduce principles with greater accuracy. The more modern methods of history taking, careful keeping of records, the acquisition of instruments of precision, the use of the clinical laboratory, the added accuracy in diagnosis, and particularly the use of the cross index system, all tend to give added importance to case summaries. The publication this year by the Bureau of the Census, Department of Commerce, of a "Standard Nomenclature of Diseases and Pathological Conditions, Injuries and Poisonings for the United States" permits medical men for the first time in this country to use the same names and terms for morbid conditions, and at once standardizes diagnostic names and cross indices. The paucity of vital statistics in the South has led us to a tabulation of the diseases present in one thousand patients selected in serial and chronological order. It is interesting to know, so few have been statistical summaries from the lower tier of southern states, that Tyson, of Philadelphia, in his "Bright's Disease and Diabetes," published in 1904, remarks that "chronic Bright's is said not to occur in the South." The Symposium on Nephritis at this meeting is a rather forceful answer.

Below is a summary by systems of the diseases present in 1,000 cases. The term "miscellaneous" includes conditions that occurred only once, and where separate mention would rather encumber the tables. All the patients were white people.

Normal	1
Diseased	999
Sex, male	480
Female	520
Ages.	
1-10	34
11-20	85
21-30	246
31-40	234
41-50	207
51-60	131
61-70	53
70-up	10
Operations	160
Wassermann	789
Positive	37
Per cent positive	.047
Wassermann on Spinal Fluid	33
Positive	6
Per cent positive	.18

DISEASES OF THE DIGESTIVE SYSTEM

Appendicitis, acute	1
Appendicitis, chronic	75
Adhesions, intestinal	17
Constipation	84
Cirrhosis of Liver	10
Congestion Liver, passive	3
Cholelithiasis	6

*Read in the Section on Medicine, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

Cholecystitis	22
Jaundice	4
Cardio-spasm	5
Gastritis, chronic	6
Hyperchloridia	15
Hypochloridia	44
Pylorospasm	9
Ulcer, Gastric	5
Ulcer, Duodenal	15
Visceroptosis, Stomach	37
Visceroptosis, Liver	2
Visceroptosis, Colon	92
Gastric Neurasthenia	7
Colitis	19
Hemorrhoids	22
Tumor, Malignant	6
" " Colon	1
" " Liver	1
" " G. Bladder	1
" " Pancreas	3
Miscellaneous	15

DISEASES OF THE VASCULAR SYSTEM

Anemia, Secondary	170
Anemia, Primary	3
Pericarditis	2
Hypotension	83
Hypertension	64
Arteriosclerosis	93
Phlebosclerosis	2
Aneurysm	6
Dilatation Aortic Arch	18
Aortitis	6
Angina Pectoris	14
Phlebitis	3
Endocarditis	12
Insufficiency, Aortic	5
Insufficiency, Mitral	64
Insufficiency, Myocardial	73
Hypertrophy, Heart	115
Dilatation, Heart	60
Stenosis, Mitral	10
Ascites	5
Edema	10
Miscellaneous	25

DISEASES OF THE RESPIRATORY SYSTEM

Asthma	14
Abscess, Lung	2
Bronchitis	30
Broncho-pneumonia	17
Lobar pneumonia	7
Congestion, Lungs	9
Deviation, Nasal Septum	15
Emphysema	12
Pharyngitis	13
Pneumothorax, Tubercular	2
Pleurisy	21
Tuberculosis, Pulmonary	62
Chronic,	
Type No. 1	9
Type No. 2	19
Type No. 3	5
Arrested	29
Miscl.	14

DISEASES GENITO-URINARY SYSTEM

Albuminuria, Adolescent	2
Calculus, Renal	3
Cystitis	19
Nephritis, Chronic	68
Nephritis, Acute	4
Uremia	4
Pyo-Hydronephrosis	2
Pyelitis, Colon Bacillus	7

MALE GENITALS

Atrophy, Testicle	5
Epididymitis	2
Hydrocele	5
Hypertrophy, Prostate	11
Prostatitis, Chronic Gon.	6
Masturbation	3
Urethritis, Gonorrheal	16
Varicocele	12
Miscellaneous	2

FEMALE GENITALS

Disorders, Menstruation	42
Displacements, Uterus	50
Pregnancy	10
Laceration, cervix	12
Laceration, pelvic floor	31
Leucorrhea	7
Cysts, Ovary	14
Cystocele	14
Rectocele	12
Fibroid Uterus	12
Peritonitis, Pelvic	5
Salpingitis	4
Urethral caruncle	2
Miscellaneous	11

INFECTIONS

Rheumatic Fever, Acute	2
Arthritis, Chronic	57
Pyorrhea	233
Infection, Focal, Teeth	126
Caries, Teeth	50
Tonsillitis, Chronic	347
Syphilis	37
Gingivitis	6
Angina, Vincents	1
Hookworm Disease	11
Other Intestinal Parasites	4
Typhus	1
Typhoid	3
Malaria	19
Tertian	18
Estivo Autumnal	1
Sinusitis, frontal	14
Sinusitis, maxillary	12
Mastoiditis	1
Meningitis, Pneumococcus	1
Meningitis, Cerebrospinal	3
Miscellaneous	15

INTOXICATIONS

Alcohol Poisoning	9
Morphia Poisoning	8
Tobacco Poisoning, chronic	7
Acidosis	1
Anaphalyxis	1

METABOLISM AND ENDOCRINES

Pellagra	53
Myxodema	6
Obesity	29
Diabetes, Mellitus	12
Diabetes, Insipidus	3
Endocrinopathies:	
Hypopituitary	13
Hyperpituitary	4
Hypothyroid	13
Ovarian	7
Goitre, Simple	7

Goitre, Cystic	2
Goitre, adenoma	9
Goitre, Exophthalmic	12
Infantilism	2
DISEASES OF NERVOUS SYSTEM	
Chorea	3
Epilepsy	9
Hemiplegia	5
Cerebro-spinal syphilis	6
Locomotor Ataxia	2
Paraplegia, Spastic	3
Poliomyelitis, Ant. Chr.	2
Sclerosis, Disseminated	1
Hydrocephalus	1
Convulsions	12
Tumor cerebellum	2
Myasthenia gravis	3
Migraine	16
Neuritis	5
Encephalitis lethargica	2
Isolated Paralysis of Muscles	4
Paralysis Agitans	2
Reynauds Disease	1
Neuralgia	3
Psycho-neuroses	110
Anxiety 10	
Hypochondriacal 14	
Hysteroid 22	
Neurasthenic 64	
Psychoses	10
Miscellaneous	10
MISCELLANEOUS	
Mal-position, Tooth	7
Tumors, Benign	30
Tumors, Malignant	15
Redundant Prepuce	6
Hernias	20
Umbilical 1	
Post-operative 4	
Diaphragmatic 1	
Inguinal 14	

As a result of our study and experience with these patients we submit our impressions generically. All these are subject to qualifications and perhaps time and further experience may modify many of them. Our science is a science of probabilties, and there are probably errors and discrepancies in the tables.

(1) Clinics and diagnostic groups deal largely in chronic medicine and proportionately less in acute medicine. The general practitioner is still the student and servant of acute medicine.

(2) In chronic medicine the pathology of a patient is often but the sum total of his habits, and the reaction of his body to them. Cirrhosis of the liver is the result of the habit of alcoholism, and pyorrhea of the habit of neglect of the mouth. A patient's habits need more accent in the therapeutics of clinical medicine.

(3) The Wassermann is a clinical guide and not a clinical dictator. Every case of tertiary syphilis is a case of therapeutically neglected primary or secondary syphilis. Of 37 syphilitics 35 were tertiary and 2 primary. Tertiary syphilis is practically absolutely incurable.

(4) A lumbar puncture is easy, dangerous if not done aseptically and by an expert. It ought to be done practically painlessly, and can easily be done in the office with no bad after effects. Drainage by lumbar puncture ought to be considered in the delirium of acute infectious diseases, after hemiplegias, and where syphilitic or neurologic diagnosis hangs in the balance.

(5) The fluoroscopic ray gives a functioning autopsy of the chest and gastro-intestinal tract. We have depended too much upon plates and too little upon the vision of a living uncut pathology as revealed by the fluoroscope. What the knife is to the surgeon in permitting him to walk by sight, the fluoroscope is to the internist. The internists should live in intimate relation with the x-ray laboratory.

(6) Every case of constipation is entitled to an x-ray study. Of 84 cases of constipation every one had a ptosis of the colon. There was a visceroptosis of the colon in 92 cases. Abdominal belts and supports are useless. A properly fitted corset is the choice in visceroptosis and permanent sleeping with the foot of the bed elevated.

(7) There are probably more cases of gastric and duodenal ulcer in the South than we have suspected or diagnosed, 20 cases, or 2 per cent in our series. No disease can be diagnosed unless it is first suspected. Theoretically, with our hot food and cold drinks, there should be more ulcers in the South than in the middle West.

(8) Hypochloridia is a frequent accompaniment of secondary anemia and is three times as frequent in this series as hyperchloridia, 45 to 14.

(9) There were 75 cases or 7.5 per cent of chronic appendicitis, nearly four times as many cases of ulcer, and it is nearly as common as visceroptosis of the colon. Chronic appendicitis is chiefly to be diagnosed by a careful history and physical examination. The x-ray does not, by any means, always help. Much former undiagnosed and unoperated acute

appendicitis has passed under the name of "colic" or "acute indigestion." "Chronic appendicitis" is by far the most frequent surgical condition of the abdomen in this series.

(10) Colitis is a not infrequent accompaniment of the psychoneuroses, as are cardio-spasm, and non-ulcerous pylorospasm.

(11) Seventeen per cent or 170 cases had secondary anemia, i. e., were below 70 per cent by the Dare instrument, as contrasted with only three cases of primary anemia. Secondary anemia is very common in the South, and is one of the causes of lassitude and weakness seen in many women. A low hemoglobin in a secondary anemia makes a patient feel just as unfit as the same low hemoglobin from a primary anemia.

(12) Hypotension is more common in the South than hypertension, 83 cases and 64 cases. Arteriosclerosis is frequent without hypertension, 93 of the former and 63 of the latter.

(13) Only 5 cases or .5 per cent of aortic insufficiency, 64 cases or 6.4 per cent of mitral insufficiency as contrasted with 10, or 1 per cent of mitral stenosis.

(14) A substernal pain is worthy of most careful study. No patient has been thoroughly examined whose chest has not been fluoroscoped. Aortitis, angina pectoris, dilated aorta, and aortic aneurysm are easily overlooked unless we listen to the patient and look through the fluoroscope.

(15) We do not understand the factors of cardiac hypertrophy. We find it often without demonstrable cause, and do not find it often where demonstrable cause seems to exist. It is difficult at times to diagnose dilatation, except when notable cardiac enlargement is present or edema of cardiac origin.

(16) Asthma is therapeutically unsatisfactory, and continued asthma means emphysema and valvular incompetency.

(17) We see in adults more broncho than lobar pneumonia, 17 to 7 in our series.

(18) Thirty-three or 3.3 per cent had active tuberculosis; 19 were moderately advanced and 5 far advanced; 29 were arrested cases, or a total of 62 or 6.2 per cent. The moderately advanced cases are most numerous of the three active types.

(19) Chronic nephritis is the most common renal disease in the South, being four times as frequent as nephroptosis. We see little acute nephritis, only four cases in the thousand.

(20) All seven cases of pyelitis were of colon bacillus origin. Autogenous vaccine seemed of service. One case of pyohydronephrosis followed typhoid fever at 5 years of age and lasted 41 years to the removal of the pus sack.

(21) Laceration of the pelvic floor, constipation and visceroptosis lessen the activity and appetite of certain women, abdominal fullness on eating develops and malnutrition and perhaps pellagra too often result.

(22) We have been somewhat disappointed in blood chemistry in nephritis as a diagnostic aid. It affords assistance as a prognostic aid in certain cases. We are impressed more and more with the value of the functional test, the fixation of specific gravity, the blood pressure, the cardiac and arterial pathology. The old fundamentals of clinical medicine and life still prevail. In America medicine is so keen to progress, that faddism and undue accent may temporarily prevail. After all, clinical medicine is the real medicine.

(23) Of 520 women, 42 had menstrual disorders, and 52 displacements of the uterus. We need more conservatism in gynecology in the South. Displacements may exist without symptoms, are compatible with health and child bearing, and are not because of their mere existence reason for a major operation. A diagnostic study of a woman is not complete unless an examination of the pelvic organs has been made.

(24) The removal of one or both ovaries during the menstrual life should receive just as much consideration and consultation as the removal of a testicle. Oophorectomy is all too easy and too common. A young woman after a bilateral oophorectomy is one of the most ruthless phycho-neurotics of endocrine origin, and helplessly pursues her helpless physician for relief long after her surgeon is forgotten.

(25) Only 12 of 520 women or slightly more than 2 per cent had fibroid tumor of

the uterus. Laceration of the pelvic floor was present in 31, or 6 per cent. This phase of obstetric surgery would seem to need both promptness and efficiency.

(26) Rheumatic fever with 2 cases is relatively rare as compared with 57 cases of chronic arthritis. There was one case of arthritis to every four cases of pyorrhea, one to every two cases of periapical infection, and one to every six cases of tonsillitis. Our impression is that caries of the teeth is relatively unimportant as a focus compared to periapical infection, pyorrhea and tonsillitis.

(27) In dealing with focal infections it is important to distinguish between the mere presence of foci of infection and symptoms that arise from such foci. We have not found a case of gastric or duodenal ulcer, a cholecystitis, an arthritis, or an appendicitis in which there were not also foci in ears or teeth or gums or tonsils or sinuses. On the contrary, we find many foci without any of the above named diseases. We feel that focal infections tend to hypotension, hypochloridia, secondary anemia, and lowered resistance. Rarely do we seem able to say definitely that the damage originated from the dental foci or tonsils or sinuses, from one or all of the foci.

(28) It is useless to treat the tonsils in a Vincent's angina of the throat unless the gums are also treated. In our experience the bacteria in this disease are carried backward from the gums to the tonsils secondarily.

(29) Sinusitis of active character was present in 28 cases, or 2.8 per cent. To be thorough a diagnostic study warrants an x-ray of the sinuses.

(30) In a non-malarial community 19 cases or nearly 2 per cent were malarial. We have seen the tertian parasite in large numbers in the blood and that with neither chills nor fever in the patient.

(31) Hookworm disease was present in only 11 of approximately 500 examinations of the feces. We feel that the chief damage from hookworm infection is in childhood and not after maturity.

(32) Pellagra showed 53 cases or 5.3 per cent, 44 of whom were women, and chiefly mild in type. Chronic abdominal pathology with resulting loss of appetite and irregular eating, may be complicated with the floating of a pellagra. There is a psychic as well as a pathological repulsion to food that seems to be the basis of much pellegra in the better classes.

(33) Obesity to the degree of disease was present in 2.9 per cent or 29 cases. The ideal weight is worthy of consideration in every patient. The danger of obesity increases with age, and necessarily overworks the heart and the kidneys, which weaken with age. Reduction in obese weight in diabetes, cardiac and renal disease is primary therapeutics.

(34) There were 30 cases of goitre, 12 of whom were exophthalmic. Diabetes mellitus showed 12 or 1.2 per cent. There were three cases each of diabetes insipidus and myasthenia gravis.

(35) There were 110 psychoneuroses, or 11 per cent, the neurasthenic, the hysteroid, the hypochondriacal and the anxiety types prevailed in order of decreasing frequency. In addition there were 10 cases, or 1 per cent, of actual insanity. More and more have we been impressed with the importance of the Psych in the practice of the art of medicine. We are in the midst of the slow emergence in our minds of a clinical psychology, and of a realization of the abject dependence of much abnormal function upon much abnormal psychology. So fierce are the mental currents in modern life, so rare is perfect mental poise, so easily does the stream of consciousness float psychic debris, once floated so rapidly does it accumulate, that this accumulation may actually block the stream and cause it to overflow into the stagnant lake of a psychoneurosis. As Minor once wrote, "it is as important to treat the mind of a patient as it is to treat his body." And we may add, as a patient thinketh in his head, so is he.

DISCUSSION

Dr. John A. Witherspoon, Nashville, Tenn.—It has not been my experience that in such a large number of cases there should have been only four cases of acute nephritis. So far as chronic nephritis goes, and the cardiorenal diseases, there are a great many of them.

I was impressed with the number of cases of visceroptoses. The general benefit or value we derive from the use of the fluoroscope or the x-ray should enable us to become more thorough in our work.

When we come to the consideration of intestinal stasis brought about by the dropping down

of the viscera, we hardly realize how much discomfort it produces. I believe it aids in developing the secondary anemias which we find so common. I believe it is the cause of mental illness, and especially a lack of energy in the subjects affected, and I think if we study these cases closely we will find that almost invariably in constipation the transverse colon will be found down in the pelvis. I saw a most remarkable case some months ago in which I was studying some of the intestinal parasites in which the transverse colon was in the pelvis. It had become adherent to the sigmoid or just where the descending colon joins the sigmoid and it actually ulcerated through and shortcircuited there. It was lying by the side of the descending colon with its large loop down. That lesion could not have been seen without the use of the fluoroscope and x-ray. I agree with Dr. Roberts that every clinician, every doctor, who is practicing medicine ought to avail himself of the use of the x-ray as much as possible. I am of the opinion that with all the value of the laboratory and the use of the x-ray, and they are great aids in diagnosis, the man who forgets to weigh up his real clinical findings will make a great mistake.

Dr. John T. Halsey, New Orleans, La.—I am going to repeat what Dr. Witherspoon has said about the extreme value to the doctor of living with the fluoroscope. It was not so very long ago that I bought one to use it as a part of my routine examination, and ever since that time I have wondered why I let myself go so long without it. It seems to me, a very much larger number of us, not simply specialists and diagnosticians, ought to have a fluoroscope and use it in our routine examinations.

There are some things that have struck me as remarkable in Dr. Roberts' figures. I am surprised that out of a thousand patients, most of them suffering from chronic disease, there should have been only 37 with positive Wassermanns. The conditions in Georgia must be different from those in most states of the Union if the figures given by him really represent anything like the average of the incidences of positive Wassermanns in a thousand cases of chronic disease. I noticed the number of diagnosed cases of syphilis is the same as the number of cases of positive Wassermanns quoted. We are not justified in looking on a negative Wassermann as evidence that the patient has not syphilis. I have seen too many cases of unquestionable syphilis with repeated negative Wassermanns to look on a negative Wassermann as conclusive proof that we are not dealing with syphilis.

The hypotension figures, 83 out of a thousand cases, arouse in my mind at once the question as to what is it that is to be considered as hypotension? I know that there is a tendency to believe that with advancing years blood pressure must rise. I have the privilege of having among my acquaintances a number of elderly patients, more than one of whom has passed the age of three score years and ten, whose blood pressure is still that of a youth of 25, and these are vigorous old men. It is not a pathologic thing for a man of 40, 50, or 60 years of age to have a blood pressure that is less than the average of his age. Increasing blood pressure with old age ordinarily means simply that there is pathology there to account for it. Real hypotension in chronic disease has been in my experience unusual. The small number of positive Wassermanns in the list is quite in accord with the small number of cases of aortic regurgitation.

Dr. Douglas VanderHoof, Richmond, Va.—A statistical study of cases is particularly fascinating, and Dr. Roberts has done a distinct service in bringing before us the results of his study of 1,000 patients. It is quite obvious, however, if one glances over the printed sheet that has been passed around, that he has catalogued symptoms as well as diseases. The first thing that impresses one in his statistics is the fact that out of 1,000 patients he found but one whom he concluded was a normal individual. I think all of us are confronted, not infrequently, by individuals who believe they are ill, and yet a most careful study appears to exclude organic disease, and these patients remain well after such an opinion. Such cases in my own practice are diagnosed as "apprehension," certainly comprising one or two per cent of the cases we see.

I am rather inclined to criticize my friend Dr. Roberts when he catalogues 170 cases of secondary anemia. There is no such disease as secondary anemia. It is a symptom, a frequent symptom to be sure, but one in which the cause may be found on proper investigation. Aside from the usual sources of loss of blood from the uterus, from the rectum, from other parts of the body, we have to consider the various toxemias. I wish to emphasize just one point, and that is, the frequent occurrence of secondary anemia in people who have complete achylia gastrica. In my personal studies we find the condition of achylia gastrica present in one out of every six patients on whom we make a gastric analysis. After the age of 50 we find there is complete achylia gastrica in one case out of three. Such cases are associated with a secondary intestinal poisoning of some kind. We do not know exactly what this is. However, a frequent symptom is pronounced anemia. When you have an individual, let us say a relatively young individual, who shows, as I have seen these cases do, for a period of months, a hemoglobin content of 50 per cent, with no evidence of organic disease, we diagnose chlorosis or secondary anemia. Not infrequently these people are digesting their food by their bowels instead of by their stomachs and have achylia gastrica. A gastric analysis reveals the cause of the anemia, and an interesting thing is the fact that the hemoglobin returns to normal rather promptly after the proper administration of full doses of hydrochloric acid.

The list of diagnoses is interesting, but again it may be criticized in that hyperacidity, edema, ascites and the other symptoms appear as diseases. I am sure Dr. Roberts has simply catalogued these various symptoms that many of his patients presented, and he does not intend to convey to us that these symptoms are his diagnoses of the causes of the patient's maladies.

Dr. Graham E. Henson, Jacksonville, Fla.—In Dr. Roberts' series of cases he reports 19 of malaria, in which I understood him to say that there occurred neither chills nor fever. This is in direct contradiction to the findings of students of malaria.

Dr. Roberts.—One of the 19 had no symptoms of malaria.

Dr. Henson.—I want to call attention to the fact that it is very unlikely that any case of malaria will go for any length of time carrying parasites without developing chills or fever. That an individual may come to us suffering with some form of disease and be a carrier of the parasites, but at the time be free of chills or fever, is of course very easy to understand.

I learned my lesson twenty years ago in the Philippine Islands in anticipating a diagnosis of malaria with the presence of parasites in the circulation. This individual had been sick for several days of malarial parasites in the circulation. A diagnosis of malaria was made, and was apparently perfectly justifiable. A blood count demonstrating a rather leucopenia, the total count being 3,500, the large mononuclears being greatly increased and in large numbers. However, in a few days the patient developed a severe hemorrhage from the bowels, and the case was proved to be one of typhoid fever. This case simply demonstrates that the mere presence of malarial parasites demonstrated in the circulation may not necessarily be a factor in the existing illness of an individual.

Dr. J. S. McLester, Birmingham, Ala.—In scrutinizing any list of diseases such as Dr. Roberts has offered it is always apparent that the list expresses more or less the observer's own personal bias. This adds interest to such a paper.

I want to say a word in defense of our old friend visceroptosis. Dr. Roberts classed it as a disease and spoke of the value of raising the foot of the bed of such patients. Dr. Witherspoon has spoken of the constipation and other distressing conditions which result from visceroptosis. I cannot help but differ radically from Dr. Roberts and Dr. Witherspoon, for I think entirely too much attention in the past has been given to visceroptosis. The position of the viscera in the abdomen is most often a mere matter of chance and seldom has any influence whatever upon the patient's disease. I cannot feel that so-called misplacement of these viscera constitutes a disease in itself.

Dr. Roberts (closing).—Dr. Witherspoon's remarks relative to the value of statistics and careful cross indices in our cases are appreciated by all his hearers. Concerning the fact that all our cases of constipation had ptosis of the colon, I have the impression that we medical men have paid too little attention to the colon, and the surgeon has tended to pay too much attention to it. This is well illustrated by Dr. McLester's reference to the patient operated upon for visceroptosis with no improvement. Correct diatetic, hygienic, supportive and exercise treatment is all very well, but operations for visceroptosis will hardly receive the general approval of the profession.

More patients come to us complaining of constipation than of any other disease. Whether Dr. VanderHoof calls it a symptom or a disease, they are constipated. Every constipated patient that we have had is also a patient with ptosis of the colon. We think these facts mean something. In women with constipation and coloptosis, secondary anemia is often present and often sixty-five per cent or below by Dare. Whether a symptom or a disease, the patient feels just as bad by one name or the other, and something must be done therapeutically.

One of the most difficult problems in diagnosis is the woman who comes complaining of her back. Is the cause an arthritis with a focal infection furnishing the flame, is it a disturbance in the pelvis with the genitals; is visceroptosis the cause; or have we a psycho-neurosis at play? It requires clinical judgment and thoroughness to decide the problem, the ultimate object being to help the patient. Here judgment before surgery, and diagnosis before action.

I agree with Dr. VanderHoof and Dr. Halsey as to the difficulty in deciding what are symptoms and what are diseases. Constipation may be a symptom in a carcinoma of the iliac colon, or a disease with an otherwise normal body.

Dr. Henson has had a far larger experience with and knowledge of malaria than the author of this paper. However, we do know that of the nineteen cases of malaria in this series, one of them had a severe tertian infection and no symptoms or complaints. Dr. C. C. Bass states that 45 per cent of malarial patients in whom plasmodia are found in the blood have no symptoms and do not even feel sick and that 55 per cent do complain of sickness, chill, fever, or some malaise. The point we are making is that some patients from malarial communities complaining of other diseases, are entitled to a careful examination of the blood for the parasites. It also shows the difficulty of eradicating malaria, when it is remembered that 45 per cent of the human host has the parasite and no sickness. The mosquito distributes parasites, but not sickness in every parasitically infected person.

SOME OBSERVATIONS ON THE FRACTIONAL ANALYSIS OF THE GASTRIC CONTENTS*

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Ever since Rehfuss first demonstrated the importance of fractional analysis of the gastric contents, great interest has been manifested in this mode of examination.

According to this method the gastric function is studied by the examination of small portions of gastric contents removed at frequent intervals after a test-meal. This method has so materially altered our views regarding the variations in gastric

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acidity, both in health and disease, that it has become necessary to revise the results of our former analyses in most gastric disorders; for, as Rehfuss has demonstrated, as soon as food enters the stomach a complicated cycle begins, constantly changes and "weaves the highly characteristic cycle of gastric digestion."

While it is quite true that under normal conditions with the Ewald test-meal, the height of digestion is usually observed in one hour, this is not true in pathological states, and many variations take place in this respect. With the object therefore of investigating the entire period of digestion, Rehfuss instituted his fractional method of analysis. The duodenal tube is given the patient at the time of taking the test-meal (oatmeal gruel), and portions of the contents are aspirated at intervals of fifteen to twenty minutes, until the stomach is found completely empty, thus enabling one to make a fractional study of the gastric secretion over the entire period of digestion as well as to obtain complete information regarding the motor activity of the stomach. One soon learns from this method of investigation that an analysis of the gastric contents at the end of an hour is by no means sufficient to allow us to draw conclusions as to the degree of acidity which may exist in any particular gastric disorder; for, whether there be either a hyperchlorhydria or a hypochlorhydria at hand, the gastric secretion may not have risen to its height at the end of an hour or may have done so before this time, and thus many phases of the hyperacidity or hypoacidity may be entirely overlooked.

It has been our habit to have fractional gastric analyses made upon every patient affected with gastro-intestinal disturbances admitted into the hospital ward during the past year and a half. The results of this series of examinations seems of sufficient interest to warrant a more careful study. There were 210 patients examined according to this method. Of these there were:

65 cases of peptic ulcer
3 " " pyloric stenosis
12 " " gastric carcinoma
5 " " chronic gastritis
6 " " gastric syphilis
22 " " simple achylias
65 " " nervous gastric disorders
6 " " secondary hyperacidity due to adhesions and other lesions
2 " " secondary hypoacidity due to abdominal adhesions
13 " " gall-bladder disease
7 " " chronic appendicitis
4 " " pulmonary tuberculosis with secondary gastric disturbance

Total 210 cases.

PEPTIC ULCER

Of the 65 cases of peptic ulcer, 34 were duodenal ulcers; 23 gastric and 8 gastro-duodenal ulcers. In 19 of these cases the highest acidity was observed in one hour; in 8 cases in 45 minutes; in 9 cases in 80 minutes; in 7 cases in 100 minutes, and in 22 cases in two hours. In 31 of the 65 cases there was a decided fall in the curves usually appearing in less than an hour and then again rising (secondary rise); in 34 instances no secondary rise was observed.

In duodenal ulcers the acidity usually rises higher than in any other condition. It reaches its height rapidly, there is then a fall and a secondary rise, or there may be a continuous prolonged rise from the onset. This rapid rise as well as the secondary rise is rarely observed except in ulcer. In our duodenal ulcer cases hyperacidity was present in 25 and normal acidity in 9; and the highest acidity appeared after an hour in 11 cases and in the hour in 15 cases. It is therefore evident that in the 15 cases, the highest acidity would have been entirely overlooked had one depended upon the hour examination alone. At times blood is obtained in the contents after the end of an hour. This finding lends additional evidence as to the presence of an ulcer and in doubtful cases may clear up the diagnosis. In as much as the Rehfuss tube does not pass beyond the stomach into the duodenum there can be little question of trauma in these cases. Rapid evacuation of the stomach contents, that is, within one and a half to two hours, is also quite characteristic of uncomplicated cases of duodenal ulcers; however, in these affections associated with pylorospasm there is a delayed motility. Hypermotility appeared in 25 of our duodenal cases.

In gastric ulcer there is no typical curve, though a secondary rise is frequent. In some instances the acidity is quite low; in some normal, but in the largest proportion

of cases there is hyperacidity. In our series there were 14 cases presenting hyperacidity and 9 with normal acidity. In our gastric cases, the highest acidity appeared after an hour in 15 and on the hour in 8 cases. The highest acidity would have been entirely overlooked in the former instances had the one examination been depended on. Blood is at times found in the gastric contents occasionally only as occult blood, but frequently it is visible.

Attention has been called to the study of post-operative cases, especially to gastro-enterostomies with recurrence of ulcer after operation by this method. The roentgen ray does not always reveal the defect in these cases, as the stomach evacuates itself of the bismuth too rapidly through the new stoma and the defect is therefore not revealed. The presence of blood in these cases lends some evidence in favor of ulcer. There is usually a delayed motility in gastric ulcer of from two and a quarter to two and a half hours; this was present in all of our cases.

It is well known that the gastric acidity is usually high in peptic ulcer, and that the symptom of hyperacidity is usually noted as an important evidence in corroboration of the diagnosis of this affection. Yet it is not unusual to observe that in the ordinary analysis a normal or even lessened acidity is obtained even though the patient complains definitely of symptoms of hyperacidity. These findings have been frequently noted in the former method of examination, and were most difficult to explain; the statement being frequently made that in many of these cases gastric hyperesthesia existed in which the mucosa becomes hypersensitive even to normal or even lessened gastric secretion.

In an analysis of the gastric secretion in 810 of our cases of peptic ulcer published in 1912 following an Ewald test breakfast:

	Cases	Per Cent
Normal acidity was observed in....	376	46.4
Hyperchlorhydria was observed in	246	30.3
Hypochlorhydria and anchidity.....	188	23.2

It is quite probable that the results of many of these analyses are incorrect and had fractional analyses been obtained a far different relationship as to acidities might have been observed.

Effect of Sippy Cure Upon the Hyperacid Secretion in Ulcer.—In 32 instances the effect of the "Sippy Cure" on the acidity of the gastric secretion was noted; a fractional analysis being made before and again after the treatment had been completed. In but 15 of the 32 cases was a decided reduction in acidity effected; on the other hand clinical improvement was noted in nearly every instance.

Crohn and Reiss have also recently shown in a large number of observations that clinical improvement may take place in cases of ulcer no matter whether the hyperacidity be reduced or not. The same may be said in regard to cases of hypersecretion. The relief in some instances may be accorded to the disappearance of the accompanying pylorospasm, but this does not account for the relief observed in those instances in which the gastric motility remains normal. The explanation must be found in the quieting effect upon gastric contractions reducing the tonus of the stomach; which need not, however, necessarily be accomplished by a reduction in acidity or secretion.

PYLORIC STENOSIS

There were three cases of pyloric-stenosis of benign origin in the series. All presented a rather high acidity even in the first specimen which gradually increased to the very end and there was a markedly delayed motility in every instance. Food particles (raisins given the night previously), were observed as shreds in the fasting stomach.

GASTRIC CARCINOMA

Twelve cases of gastric carcinoma were tested in this series. There was present a true achylia in every instance. The total acidity varies much in these cases. In three the total acidity remained at 10 or below, while in the remaining 9 cases it was much higher in certain specimens; 25 in one, 30 in another, 40, 45, 50 and 55 in others. In those specimens presenting a high total acidity lactic acid was usually present. Blood was frequently present in the specimens and appeared at any time during the period of digestion; mucous was usually abundant. The Wolff-Junghans reaction was positive and the protein curve diverged quickly from the acid

curve; considerable amounts of albumin being present usually within three-quarters of an hour, the quantities being markedly increased to positive reactions within an hour or an hour and a half. The quantities of gastric secretion obtained varied in this condition according to whether there was or was not a pyloric obstruction at hand. In the non-obstructive cases there is a very rapid emptying of the stomach, while in the obstructive forms there is marked retention.

CHRONIC GASTRITIS

There were five cases of chronic gastritis in this series and all were cases of true achylias. In this group the same characteristics were observed as one usually finds in simple achylias. The total acidity is usually higher; at times as high as 40 during the period of digestion, in addition mucous is obtained in almost every specimen which is not so frequently observed in simple achylia. The motility of the stomach is usually delayed.

GASTRIC SYPHILIS

The six cases of syphilis of the stomach are interesting in as much as they presented curves similar in respect to the gastric secretion as those observed in cancer. The total acidity rose to between 40 and 59; there was complete achylia and the stomach emptied itself rapidly.

ACHYLIA GASTRICA

In our series there were 22 cases of true achylia gastrica. There were present in addition a number of spurious or false achylias which cannot be properly included in this list. A number of these false achylia cases presented an excess of free Hcl at the end of one and three-quarters to two hours; in several instances of from 70 to 85, and were thus really cases of delayed hyperacidity, attention to which will be called later on. Rehfuss has pointed out the distinction between psychic achylia in which there is a suppression of the secretion during the first stage of digestion and a chemical achylia; a total absence of both secretions would indicate a complete achylia. The 22 cases of true achylias included 7 cases of pernicious anemia all of which presented the same characteristics as were observed in the simple achylias.

In the true achylias in addition to the fact that free Hcl is absent in every specimen, the total acidity is very low, rarely rising above 10 to 15. In the fasting stomach there is none or but little gastric secretion and the stomach is empty within two hours, usually in between one and one-half and one and three-quarter hours. The ferments are absent or are much diminished. Blood is occasionally found in these cases; sometimes visible, sometimes occult. This is largely due to the friable state of the gastric mucosa in this affection which is quite apt to bleed. Bile is frequently regurgitated into the stomach during the early period of digestion and is often found at the end of twenty or thirty minutes.

NERVOUS GASTRIC AFFECTIONS

There were 65 cases of various nervous affections included in this group which represent largely the various forms of hyperchlorhydrias and hypochlorhydrias together with a few instances of normal acidity. The hyperchlorhydrias included 34 cases of simple hyperchlorhydrias; three of hypersecretion and 7 of delayed hyperacidity; in addition there were 17 cases of hypochlorhydrias, not including the achylias already described and 4 cases with normal acidity. In the hyperchlorhydria cases the acidity rises rapidly, there being usually a single rise with a normal motility. The acidity may range to 100 or over. In the cases of hypersecretion the gastric secretion may continue for hours. The cases of delayed hyperacidity are extremely interesting. They are frequently classified under the term of false achylias and present an absence of free Hcl according to the old method of examination an hour after an Ewald test meal; however, with a fractional analysis one soon realizes that he is dealing with spurious forms, the acid being present before or after the hour.

In our 7 cases presenting this condition an increase of free Hcl of from 70 to 85 was observed at the end of one and three-quarters to two hours. In the group of 17 cases of hypochlorhydrias are included the nervous gastric affections with a low Hcl content throughout the entire period of digestion. In no instance did the total acidity range above 25 nor the free Hcl above 20. Included in this group is a case

of multiple sclerosis, paralysis agitans, epilepsy, cerebrospinal syphilis with gastric symptoms and a number of cases of enteroptosis.

The 4 cases with normal acidity presented no features of unusual interest.

SECONDARY HYPERACIDITY

This group includes 6 cases of hyperacidity due to adhesions and reflex causes including abdominal adhesions, kidney and genito urinary affections. The curves of these cases follow closely those described under the heading of hyperchlorhydria, the acidity rising rapidly without presenting a secondary rise ranging to 100 or over, the motility of the stomach being normal.

SECONDARY HYPOACIDITY

There are two cases of secondary hypoacidity in this group due to abdominal adhesions. In both instances there was present a low gastric acidity throughout the period of digestion; the total acidity being 18 and 20, and the free Hcl 14 and 15 respectively.

GALL-BLADDER AFFECTIONS

Thirteen cases of gall-bladder disease are included in this group. Of these one presented a normal acidity; 7 hypoacidity; 3 were cases of true achylia and 2 of hyperchlorhydria. The curves in these affections presented no variations from those ordinarily observed in the various forms of acidity.

CHRONIC APPENDICITIS

There were 7 cases of chronic appendicitis included in this group; all of which presented a marked hyperchlorhydria with normal motility. The acidity ascended quickly to 80 or over and did not descend until the end of the digestive period.

PULMONARY TUBERCULOSIS WITH SECONDARY GASTRIC DISTURBANCE

Four cases of gastric affection due to pulmonary tuberculosis are included in this group. In all there were present a true achylia gastrica. The total acidity was low and there was an increased motility.

In the study of acidities by means of fractional analyses, Rehfuss has demonstrated in interpreting a series of curves of fractional analyses, that normal individuals respond differently to their test meals. Some will respond with an excessive and hypersecretion, the so called hypersecretory type; some are sluggish, the hyposecretory type, and finally a certain number approach a somewhat normal type isosecretory. High acid figures are obtained in health, and according to this observer, there is a large group of normal individuals with hypersecretion (40%). In health there are alternate cycles of activity and rest; digestive and inter-digestive periods.

In the digestive period, psychic stimuli produce a psychic secretion which is later augmented by a true chemical secretion. At the beginning of peristalsis there is a gradual increase in acidity until the acidity reaches a certain height, then active tryptic regurgitation takes place neutralizing this acidity to a more or less degree. This is the interdigestive period and is observed typically in the empty stomach, the total acidity falls (average 30), the percentage of free Hcl (average 18) is quite low. At this period bile is usually, and pancreatic secretion practically always present in the gastric contents. Soon after the ingestion of food the digestive period begins which is followed by a gradual rise in acidity. Rehfuss emphasizes the fact, that the highest curves of acidity are present in health and that a very high acidity is frequently obtained in individuals without being accompanied by any gastric discomfort whatever.

In certain diseases such as in ulceration of the stomach which are usually accompanied by hyperacidity the symptoms, according to Rehfuss, are by no means accounted for by the hyperacid state, but are produced by a vagotonia and are induced by a persistent disturbance in the harmonious sequence of the digestive and interdigestive phases. Attention has already been called to the observations of Crohn and Reiss and our findings are entirely in accord with these, that clinical improvement may take place in cases of hyperacidity (this especially refers to ulcer cases) no matter whether the hyperacidity be reduced or not, indicating that the symptoms ordinarily attributed to the excess of acid are not necessarily due to this factor but must be attributed in many instances

to other conditions. On the other hand Rehfuss and Hawk have more recently again called attention to the fact that no pathognomonic curve exists in any gastric affection. It is quite true that we do find tendencies usually to certain types of motor and secretory alterations, but these are in no way absolutely distinctive and cannot be relied upon alone as specific for any gastric disorder.

CONCLUSIONS

From our study of the two hundred and ten cases in which fractional analyses were made, we believe that the following conclusions may safely be drawn:

(1) By means of fractional analyses we can study the entire cycle of digestion both as to the secretory and motor activity of the stomach.

(2) By complete aspirations at any period of digestion we can obtain definite information regarding the amount of secretion.

(3) In duodenal ulcer the acidity is usually higher than in any other condition. There is a rapid prolonged rise followed frequently by a fall and a secondary rise, though there may be a continuous prolonged rise from the onset. The highest acidity appears frequently after an hour. Blood is at times found in the contents, which lends additional evidence as to the presence of an ulcer. Rapid evacuation is rather characteristic of uncomplicated forms of duodenal ulcer.

(4) In gastric ulcer there is no typical curve of acidity though a fall followed by a secondary rise is frequent. Hyperacidity is usually present though there may be a low acidity or a normal acidity, the highest acidity appearing after an hour in most cases. Blood is obtained at times in the gastric contents, which presents further evidence in favor of ulcer. There is usually delayed motility in gastric ulcer.

(5) By means of fractional analyses the acidity in any period of the cycle of digestion in ulcer may be noted. The highest acidity frequently occurs after an hour and occasionally before, so that its appearance would be entirely overlooked should we rely entirely upon the hour extraction.

(6) The effect of an ulcer cure upon the hyperacid secretion can be followed by means of fractional analysis. In but half the cases, however, is a decided reduction in acidity obtained even though clinical improvement may be noted indicating that the symptoms ordinarily attributed to the excess of acid are not necessarily due to this factor.

(7) In pyloric stenosis there is usually a high acidity during the whole period of digestion with delayed motility. Food shreds are observed in the fasting state.

(8) In most instances of gastric carcinoma one finds a typical achylia frequently with delayed motility and a rather high total acidity and with lactic acid and blood. The Wolff-Junghans test is positive; considerable amounts of albumin being present within three-quarters of an hour; being markedly increased within an hour to an hour and a half.

(9) Cases of chronic gastritis present the same characteristics as are usually observed in simple achylias. The total acidity is usually higher, however, and in addition mucous is obtained which is not frequently observed in simple achylia. The motility of the stomach is often delayed.

(10) In gastric syphilis the curves of acidity are similar to those observed in cancer. The total acidity is high and there is a complete achylia; the stomach emptying itself rapidly.

(11) Fractional analysis of the gastric secretion according to the Rehfuss method is extremely important in all cases of achylia gastrica, inasmuch as by means of this method one can easily differentiate the true achylias from the spurious forms. This differentiation is extremely important, inasmuch as many of the false achylias present a very high Hcl acid index; sometimes marked hyperacidity, and are in fact, really cases of delayed hyperacidity. In the true achylias free Hcl is absent in every specimen; the total acidity is low and there is a marked hypermotility. In pernicious anemia one observes the typical features of a true achylia.

(12) In nervous gastric affections one observes the various forms of hyper, hypochlorhydria or normal acidity. The hyperchlorhydrias present a rapid rise in acidity 100 or over with a normal motility. One frequently notes among these cases the so-called false achylias, with an ab-

sence of free Hcl at the end of an hour, yet presenting a hyperacidity before or after this period.

(13) In gall-bladder affections one observes a tendency to a lowered acidity and achylia, while in chronic appendicitis hyperacidity is usually observed.

(14) While fractional analyses are of the greatest importance and usually present additional evidence in diagnosis, a study of our cases, together with the observations of Rehfuss, leads us to the conclusion that no pathognomonic curve exists which can be considered as absolutely distinctive of any gastric affection.

DISCUSSION

Dr. Seale Harris, Birmingham, Ala.—I have used the fractional method of estimating the acidity of the gastric content in a great many instances, and after a rather thorough trial of the method, as I thought, I have failed to see that it is of much greater value than the older method of extracting the stomach contents about one hour after the introduction of a test meal. As Rehfuss, who is a pioneer in this work, has pointed out, there is no pathognomonic curve in the fractional method that is definite regarding any gastric disease. The question of a difference of a few degrees of acidity of the gastric content at definite times after the ingestion of a test meal is not of great value in making a diagnosis. Of course in gastric ulcer in a great majority of cases hyperacidity is found early the first few years after the ulcer develops. Later on a less degree of acidity is found, and in many cases, particularly the long standing cases, pyloric stenosis, in which there is retention of food, a low degree of acidity is found.

I think the fractional method is of the greatest value in cases of achylia. Where there is a question as to a true achylia or a spurious achylia I think the fractional method should be tried. I think, however, that in the spurious type of achylia on repeated examinations we will find that there is more hydrochloric acid present at the end of an hour in most cases. I have been quite surprised in some cases in which there had been no hydrochloric acid to find on repeated examinations at the end of an hour after the test meal, an increase in acidity.

The work of Rehfuss is a distinct advance and is very interesting, but I am frank to say that in a majority of cases it does not help us very much in our diagnosis, and it certainly adds a great deal to the laboratory work required in gastric diseases.

Dr. Bryce W. Fontaine, Memphis, Tenn.—I am very much of the opinion of Dr. Harris, that the Rehfuss tube does not give us much more information than repeated tubing with the old fashioned tube. I have gotten the most value out of the use of the Rehfuss tube in the study of achylias. It strikes me that the introduction of the Rehfuss tube, and the irritation at the end of the tube in the stomach, might produce findings that would vitiate the real value of the method. The tube is more advantageous in the study of gall-bladder infection, but the Jutte tube is passed with more ease, and I think replaces it in a large measure. Of course, the original study of Rehfuss should not be overlooked. He was a pioneer in the work, and should be given credit for his researches in hyperacid cases, and in achylias, but in my experience, the Jutte tube has given more satisfaction.

Dr. J. C. Johnson, Atlanta, Ga.—A paper can be just as valuable from a negative standpoint as from a positive. The value of any man's testimony depends not only on his mental retrospective, but his mental perspective and the character and source of his knowledge. Notwithstanding the fact that I have been trying to practice medicine for 30 odd years, and have been trying to practice gastroenterology for nearly 30 years, and have seen thousands of cases, I have never yet used this method in test meal estimation.

I have never been able to understand how, with the constant presence of the tube in the stomach the psychological effect can be avoided. The amount and character of the food itself changes the amount and character of the secretion in the stomach; how then, with our theories of the associate chemical and physical action of gastric secretions on gastric motility can we remove any part of the contents at any time, and not change the ultimate estimate of that content? According to my understanding of the fundamental principles of scientific medicine, I believe that we cannot get an accurate estimate if you disturb the stomach more than one time during a meal. That is one of the reasons I have never adopted the method.

Another reason is that I have not had time to use it. A great number of patients in a doctor's office does not allow him time to take a very large number of fractional test meals. I doubt very seriously whether, if the profession as a whole should adopt the fractional test method we would gain as much as we might lose in other directions.

Dr. Harry G. Walcott, Dallas, Texas.—My experience has been very similar to that of Dr. Harris. I used the fractional analysis in some cases and felt the results were not of sufficient importance to justify the time required, and as a result I have discarded it except in a few cases, especially cases of achylia.

Like Dr. Johnson, my time is so occupied that I have not been able to give and withdraw the meals myself, and unfortunately our hospital facilities are such that I could not rely on the internes or nurses to give them for me.

Dr. Friedenwald (closing.)—In the first place I wish to say that this is not a method for practical use in an office; it is a method to be employed in hospitals. This series of experiments was largely conducted by assistants who lived in hospitals and who were very much interested in carrying out this work. The patient usually remained in the hospital a few days before the examination was made in order to become accustomed to the atmosphere of the hospital, but I must say we have had little difficulty in having the patient swallow the tube, practically none. I do not believe it is of any special importance what form of duodenal tube is utilized, Jutte or

Rehfuss. Any will pass easily into the stomach, and we can practice this method without the slightest difficulty in a hospital. I can see the objection, however, in private practice, and I do not believe that in office practice this form of examination could be utilized to any large extent except in rare instances.

This is really a very important method of examination. I believe we can probably do without this method in the acid cases, because if a patient complains of symptoms of hyperacidity and after an ordinary Ewald meal we obtain but little acid, we can usually take for granted that the patient is hyperacid. But when we consider the achylia cases we have a different problem at hand and it seems to me this is the only way in which we can clear up such cases, and they should always be cleared up. I have had cases in which the Ewald meal revealed a complete absence of free hydrochloric acid and yet the patient complained of symptoms of hyperacidity, and when the Rehfuss method was used (the fractional method) quite a different relationship was obtained. In an hour and a half to an hour and three-quarters there would be a sudden rise of acidity sometimes far above normal.

Now I do not believe that by introducing the tube and allowing it to remain any change in the secretion is occasioned. In other words, the tube is not in itself irritating. I have tested this in two or three instances in order to determine this very point. Patients were given Ewald meals and the contents removed at varying periods with the ordinary tube; and the results corresponded quite definitely with those obtained by means of the Rehfuss method.

PELLAGRA*

By John L. Jelks, M.D., F.A.C.S.,
Memphis, Tenn.

This name is misconceived, and this nondescript, this orphan must be rechristened. It has no more right to be called pellagra than has typhoid fever to be called rose spot, or pneumonia flush cheek, or rust sputum.

I have been forced to use the term "pellagra" on this occasion in order that the profession may know what I am talking about. But, let it be distinctly understood that hereafter, I shall refuse to accept this ill-bred title of this infectious disease which sometimes portrays skin symptoms.

In April, 1910, June, 1910, and every year since, I have insisted time and again that we were dealing with an infection in the intestine, and strange it appears to me now as it did then, that clinicians and research men refuse to seek knowledge without prejudice, and have refused to this good day to look in the intestines for a cause as did the children of Israel refuse to look upon the brazen serpent and be healed.

In March, 1910, when I saw my first case of "pellagra," examined the gut and the gut contents, observed the same clinical manifestations and the same skin manifestations, only the latter in an exaggerated degree, that I had observed in amebiasis, which had induced me on a previous occasion to write an article on skin manifestations of amebiasis, I reasonably supposed that the ameba was the sole cause of "pellagra." This information was conveyed across the continent to a physician attache of the U. S. Hospital Service, who later wrote an article and received full credit for the information I had conveyed, and at the same time exhibited pictures of Dr. Wm. Litterer's patients of Nashville. This gentleman was accorded full credit, for the *Journal of the American Medical Association* never published Dr. Litterer's and my discussions and refutations.

I referred then or a short time afterward to the presence in some of the cases of not only the Ameba histolytica, but also the Cercomonas or Trichomonas intestinalis.

During the last three years I have taken more interest in the always present flagellates in these cases, for frequently I have failed to find the ameba, and have never failed to find the flagellates in them, whereas, I quite often found pure ameba infection and ulcerations without the presence of the flagellates and without skin manifestations, and found the pure flagellate infection with skin manifestations; "pellagra."

Several cases of combined degeneration of the cord have been examined by me for eminent neurologists, and these likewise, have been caused by intense flagellate infections. Some of these have exhibited the skin manifestation "pellagra" and some have not. So, I have concluded, but without other than clinical proof, that in different cases we may have different portions of the cord affected by the toxins evolved in some yet unexplained way, and

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which causes the cord pathology. I beg to recall to your minds the article of Dr. Wm. G. Sommerville, read before this Association last year, and his reports of some cases of combined degeneration of the cord.

I have referred to the frequent intense colon bacilluria and bacillemia in some of these cases.

A year ago I interested a laboratory technician (Mr. Abner) in my study of the intestinal infection in these cases, and during the course of this some facts were established and some conclusions reached by us.

First, in a series of over 100 cases examined of "pellagrins" and combined degeneration of the cord, in some of which were no skin manifestations, and in some skin symptoms developed later, the flagellates were always found. We invariably found distinct symptoms when a marked infection was found. Mr. Abner began a series of chemical experiments and found that in every case of "pellagra," in every case of flagellate infection and in every case infected with the ameba histolytica, he got a positive gentian violet reaction within 12 to 48 hours using a fecal emulsion, whereas, if feces from a healthy person were used no reaction took place. We were led in some cases to continue search for the kind of infection in which we at first failed to find the infecting organism, for by this time we had learned to place reliance upon our chemical reaction. These observations and reactions were shown the Fellows of the American Proctologic Society, who spent two days in session and as our guests in Memphis this spring. They were shown dying cases, cases which had both the "pellagrous" skin symptoms and combined degeneration of the cord with paralysis. They saw those afflicted who came from the upper strata of society as also from the hovel; for as I told you at our Dallas meeting, this infection is like typhoid fever, no respector of person or pride, wealth or station, but in the vernacular of the Oklahoma doctor it is "catching and killing."

This chemical reaction is so trustworthy yet so delicate that the virulence of the infection and the severity of the effects of the infection on the patient has been shown by more or less quickly responsive effect upon the gentian violet solution.

We observed that after a case had been successfully treated the reaction became less marked and, finally, negative. This work has been carried on in the Baptist Memorial Hospital and in Dr. J. R. Fleming's laboratory and mostly among my private cases, but I am so confident now of the sufficiency of our observations that I am presenting them to you. Some have said a large percentage of people in their sections are infected with these flagellates. Yet, they were not all "pellagrins." However, many throats contain pneumococci and Koch bacilli who have neither pneumonia or diphtheria.

I shall not at this time endeavor to explain this fact but, I do say that in our country, and in my cases, I don't find severe flagellate infection without more or less severe clinical manifestations. Mr. Abner is of the opinion that the Cercomonas and Trichomonas are the same organism, and we find in the majority of cases both Cercomonas and Trichomonas. We have concluded they are the same but in different cycles, also, that the toxicity appears greater in certain cycle stages which we have not determined.

The writer has suffered a series of misfortunes while attempting to contribute something to his profession and to humanity. One instance was the elimination of all pellagrins from the rooms and wards of our hospitals. Another was the sudden resignation of my technician from the hospital and his leaving Memphis, carrying with him the laboratory reports and stained specimens of most of my cases. I have been unable to locate him.

The flagellates are known to be quite prevalent in the intestines of the guinea pigs, rats and other animals. In one guinea pig in our laboratory a severe diarrhea was established with a sudden loss of appetite and flesh and death quickly ensued. No cause could be found except a virulent flagellate infection.

Then, what is this disease? What name is justifiable since I have cause for the rejection of the term "pellagra"? Until some one can offer a more appropriate one, I suggest the term entericus flagellata (Viridans).

Many cases of more or less severe flagellate diarrhea have developed in the outlying and suburban districts of Memphis during the last year. Some of these developed about the time a sewer contamination of our artesian water occurred, and civil suits against the city and water commissioners followed.

I believe I could have given testimony which would have thrown these cases out of court. They were in what I have for a long time known as infected districts; that is to say, districts in which I had found many cases of ameba, flagellate infection, and "pellagra."

Most of my cases of flagellate infection with or without "pellagrous" symptoms are traceable to precedent cases and are in unscreened, unsewered and insanitary environments.

I submit herewith the laboratory report of Mr. Abner, which was presented in April to The American Proctologic Society.

A supplement of many cases could be added, but this should be sufficient until the government and other research laboratories conduct the experimental work which I was prevented from carrying on when my technician left me.

PRELIMINARY REPORT ON GENTIAN VIOLET REACTION AS A NEW AND ONLY TEST FOR PARASITIC INFECTION OF THE INTESTINAL TRACT

Laboratory work by Mr. A. G. Abner, of the Baptist Memorial Hospital Laboratory, and Dr J. S. Fleming, of Fleming Pathological Laboratory.

The research work on this phenomenal reaction has so far been carried out on three parasitic infections, viz., ameba histolytica, and Trichomona and Cercomona intestinalis, and on certain inhibitors.

TECHNIC

From a capillary pipette, 1/16-inch in diameter, place one drop of a saturated alcoholic (never aqueous) solution of gentian violet in six c.c. of a solution (fecal emulsion) consisting of 1/4 c.c. of suspected feces plus two c.c. of broth, brought up to six c.c. by adding four c.c. of distilled water. With a cork stopper in tube, invert end for end a few times, and incubate at 37° centrigrade, shaking contents about three times daily.

If decolorization occurs within six to twenty-four hours or up to forty-eight hours, it is considered a positive reaction and denotes a parasitic infection, whether or not parasites have been found previously by either warm fresh stool examination or stained specimens, or both.

If decolorization does not occur, it is considered a negative reaction.

Therefore, the test is valuable for control in the course of treatment following positive findings. If there is a negative reaction and nothing is found in either fresh stool or stained specimen, it would denote that the patient is free from infection, probably permanently. But if there is a positive reaction, it would denote that the patient is still harboring parasites, and the treatment is continued.

A normal fecal emulsion remains unchanged from seven to ten days, while a positive reaction occurs within one to two days.

A positive reaction may vary somewhat in the color change, some being completely decolorized and others showing a slight pinkish violet according to the severity of the infection. Negative tests remain violet or purplish.

Emetin does not inhibit the reaction, but certain drugs and body fluids are inhibitory. Bismuth preparations produce black or violet; thymol, blue or light blue; bile, brownish blue; and blood, reddish violet.

Tests should be made before and a day or two after treatment. Before they are made the patient should be free from any of the above inhibitors. The presence of these can easily be determined by examining the feces; bismuth by the black color, thymol by the peculiar odor, bile by objective and by Smith's test, and blood by finding the red cells and by chemical test.

Three controls should be made: 1, suspected feces; 2, normal feces; and 3, gentian violet alone.

The following cases were carefully examined microscopically of warm fresh stools and stained specimens, culturally and by the gentian violet test.

The cases numbered forty-eight with seventy-one examinations.

(A)	Positive gentian violet reaction and positive for Trichomona	46%	22 cases
(B)	Negative gentian violet reaction and negative for parasites	44%	21 cases
	Of these		
	(a) 35%—17 cases—negative for both—untreated.		
	(b) 9%— 4 cases—negative for both—treated.		
	44%—21 cases (three had long treatment and one had bismuth before test).		
(C)	Positive gentian violet reaction and positive for Ameba (one for both Ameba and Trichomonas)	6%	3 cases
(D)	Positive gentian violet reaction, but negative for parasites	4%	2 cases
		100%	48 cases

OBSERVATIONS AS TO PELLAGRA

(1) All patients with positive findings showed pellagra symptoms and were diagnosed as pellagrins.

(2) All patients with negative findings showed no pellagra symptoms, except the four cases in B which did show pellagra symptoms and were therefore diagnosed as pellagrins.

(3) Nine cases of the absolute negatives in B, having no parasites or symptoms of pellagra were used as controls; while the other eight having doubtful symptoms of pellagra, were not diagnosed as pellagrins.

(4) The facts, that a negative reaction was obtained in cases showing no parasitic infection and no symptoms of pellagra, and that a positive reaction was obtained in cases showing such infection and having been diagnosed as pellagrins,

would suggest that this gentian violet reaction, though in its infancy, would be of great value to the physician in his private practice. The test could be made easily in his office.

CONCLUSIONS

(1) Cercomonas and Trichomonas are probably one and not different parasites.

(2) Infection occurs through vegetables grown in lowlands and in many instances fertilized with human excreta.

(3) Frogs, guinea pigs and mice are known to have Trichomonas, and are usually found around barn yards, gardens and dwellings.

(4) The Commission on Pellagra in Illinois in 1912 were unsuccessful in bacterial findings in the intestinal tract of pellagrins, but, out of sixty-two cases, in forty-eight examinations, 77% showed Trichomonas infection, and in thirty-six examinations 56% showed ameba infection.

(5) Pellagra is probably due to parasitic infection, and the habitat of these parasites is the intestinal tract. The robust and delicate are subject alike to the infection, once the parasites have gained entrance to the tract.

(6) As to the specific organisms causing pellagra we are still in doubt, and until we can further isolate, cultivate and do animal experimentation, we cannot safely make such assertions.

The interest we have taken in this work for many years and our endeavor to prove that parasitic infection is the cause of pellagra, has made available a new and most valuable test for parasitic infection of the intestinal tract in man.

DISCUSSION

Dr. J. E. Knighton, Shreveport, La.—The question of pellagra and its cause is one that always stimulates discussion, because there is a variety of opinion upon the subject and has been for time immemorial. Those of us who have been in the meetings of the Southern Medical Association during the past few years know something of the work which Dr. Jelks has been doing. We are bound to respect his opinions for the simple reason that we know he has been doing serious work along this line, and anyone who studies a subject and works out a certain line of thought must be respected for his opinions and findings.

However, the question of the cause of pellagra to my mind is as clouded as it ever was. The presence of flagellates and other organisms in pellagra may occur as a part of the disease or may be incidental. We should keep in mind the fact that pellagrous patients practically all have an absence of hydrochloric acid in the stomach, and as a result many organisms may enter the intestine which would be killed in the stomach if hydrochloric acid were present. In a case of pellagra with absence of hydrochloric acid many flagellates may develop because of the absence of hydrochloric acid. Many of us may be taking into our stomachs organisms that might develop lower down if we did not have hydrochloric acid in the stomach to protect us. In the community in which I practice pellagra is almost a curiosity just now. A few years ago there was more pellagra than anything else. In 1914 it was not unusual to hear a country doctor say he had fifty cases of pellagra on hand. During the season he would perhaps have two or three hundred cases. But during the past year I have only seen one case.

Dr. George M. Niles, Atlanta, Ga.—The name of the disease came to us from the Italian name, pelle agra, meaning "rough skin." The pronunciation of the word should be uniform. Any man ought to know how to pronounce his own name, and the inhabitants of any city or state ought to know how the name of that city or state should be pronounced. If a citizen of Italy gave us this name "pellagra," I think he is entitled to the pronunciation. The *a* has the same sound in pellagra as the *a* in *father*.

Dr. Jelks speaks of the absence of skin symptoms. Those who have studied this disease know that it presents a four-fold syndrome, but it is not necessary that all of the units should be present. These units are digestive disturbance, nervous disturbance, psychic disturbance, and skin manifestations. Therefore the neurologist, the dermatologist, the gastroenterologist and internist, and even the surgeon have a whack at these poor unfortunates.

Again, one or more of the units of this syndrome may manifest itself and the patient may go along from year to year showing indefinite nervous troubles, indefinite gastrointestinal troubles, indefinite psychic troubles, where we note neither temperature changes, nor skin changes. I have known a number of cases where there have been no definite troubles by which to diagnose pellagra, but if for some reason the patient would have occasion to take an ether anesthetic, in three or four days the bilateral manifestations would appear. That shows we have to be cautious about it.

I am not prepared to say that pellagra is not as good a name as any, and if we can find a really better name, one more descriptive, we should adopt it and stick to it.

As to the specific etiology it is not clear by any means yet. My impression is that it is due to an improperly balanced diet over a length of time, and that there must be a certain amount of predisposition, because some members of a family will develop it and others, where they have had the same surroundings and the same diet, do not.

This is still a subject *sub judice* and no man is wise enough to say he has found the answer.

Dr. John A. Witherspoon, Nashville, Tenn.—Intestinal paraiste infection throughout the South is getting to be such that we must pay attention to it. I do not agree with Dr. Jelks in all of his findings. I have seen pellagra and in my own practice I have not been able in some of these cases to find any of the flagellates. I have seen other cases in which we found a number of Cercomonas without symptoms of pellagra. Now the question is, is this an etiological factor? I believe in the South most people have flagellates; but they all do not have pellagra. Some have diarrhea and some have not. I have seen plenty of cases in which you can find Cercomonas hominis without diarrhea at all, and without any of the other symptoms of pellagra.

A few years ago pellagra used to be very prominent. Now we do not see it. I saw a case just recently from western Tennessee, but I believe

that is all I have seen this year. With this woman we have made repeated stool tests without finding any parasitic infection at all. She has all the skin manifestations, she is intensely nervous and has everything to show the usual case of pellagra, without any finding of parasitic infection in the bowel. We had her at the hospital and made repeated tests, gave her salts and flushed the bowel and made tests, without finding any parasites.

I am not so sure that flagellates are disease-producing at all. I am in doubt as to whether the Cercomonas really produce any pathology. You take a case of ameba where you find amebae and flagellates together, and the amebae will yield to emetin and quinin irrigation, but the flagellate bodies, being inhabitants of the small bowel, do not respond. I have used every kind of treatment even arsphenamin. Some will get well themselves and some will not get well regardless of treatment. These people are perfectly healthy in many respects, but still they present these symptoms.

I admire Dr. Jelks for sticking to this because I think we should take into consideration the question that intestinal parasitic diseases are frequent in the South and that we are going to get more cases in the future. So far as the amebae are concerned and the flagellate bodies, and what part the flagellates play, I do not know. I used to think they were a separate entity, but now I do not know what I think. But I do know I have seen many cases of pellagra in years gone by that did not have flagellate bodies. Jelks has been doing this work and a great many other things and deserves credit for it, but I am in the frame of mind where he will have to show me.

Dr. Harry G. Walcott, Dallas, Texas.—I believe Dr. Jelks' work is in the right direction. About 1911 or 1912, I reported 100 consecutive cases of pellagra in which I examined the stools and found flagellates in all, and in some cases ameba. My text-book had said that flagellates were non-pathogenic and like the most of you, I started out in practice with that idea. But my personal observation has been that where we have the intestinal flagellates we have increased auto-intoxication, even if the patient is suffering from constipation, and so I feel it is an error to say that flagellates are non-pathogenic.

In practically every case where we have the flagellates and ameba, we have an auto-intoxication which in turn has a deleterious effect on the nervous system.

Dr. Homer S. Bruce, Opelika, Ala.—I have treated a great deal of pellagra in Alabama and my experience is that of others, that we have not so much pellagra this year as in the years previous. I have watched cases and tried to arrive at some conclusions about the people who are most liable to this disease, but as someone has said, it is no respecter of persons. I think we can make a classification of about three classes of people who are prone to have pellagra. First, those of the most improvident and poorer class who are under-nourished. Second, the middle class of people who do light housekeeping who are busy and prepare extemporaneous meals, and third, the better class, those who can buy luxuries and who become invalids from other causes, and who are really over-nourished. Viewing it from a narrow point of view you might reason that it is some nutritional disorder. However, if you watch families and communities and take the history back to the time when it is first recognized as pellagra, it carries with it the idea of infection. In our country we have tenants who move from one place to another, and we find some places that seem to be infected. That may have some bearing on the question. Pellagra has diminished in the last year or eighteen months.

Dr. John B. Thielen, Knoxville, Tenn.—I am doing gastro-intestinal work and examine personally a great many stools. Twenty-five years ago nobody would have said tuberculosis was contagious because the bacillus had not been found. It does not seem that we should say pellagra is not an infection just because we have not demonstrated the microorganism.

Another factor enters into the cases of pellagra. It first developed in Italy, then in France and Spain, and finally in the southeastern part of the United States. If you look at these countries you will find the climate is pretty near the same, so evidently the climate plays some part. Heat and moisture are known to develop disease. They do not have it in Russia, in Germany, nor in climates like New York or Chicago. These people do not live any better there or have a higher protein diet than in the Southeast. I have lived in both sections. We eat more vegetables in the South than they do in the North. It seems to me then that there is the factor of climatic conditions and it is not altogether one of diet.

In New York a number of years ago we had a series of cases at the Post Graduate Hospital which were examined and found to eliminate a high percentage of nitrogen. It was not always in the form of urea, but in ammonium urate and ammonium carbonate.

Dr. Sidney K. Simon, New Orleans, La.—I do not want to appear pugnacious, as I imagine Dr. Jelks has already considered me, but I am one who, to put it in common language, does not take any stock at all in Dr. Jelks' theory. Dr. Jelks' theory of flagellate and entameba origin of pellagra has been like Banquo's ghost bobbing up at every one of our meetings for several years. Each year we have tried to bury it, only to find it appearing again. I put it in that way because as yet Dr. Jelks has presented no scientific data to substantiate his belief. Probably I have not had as much experience with pellagra as Dr. Jelks in a clinical way, because I must confess I have seen comparatively few cases in New Orleans in recent years. Certainly in my own service I have seen few cases in the last two or three years. I have seen real flagellate infections and Entameba histolytica infections, but I cannot see, from a clinical standpoint, an experimental standpoint, or any other standpoint from which we judge new theories in medicine on a strictly scientific basis, any place for Dr. Jelks' theory. To my mind pellagra is the result of five-cent cotton in the South. In the days when pellagra broke out as an epidemic cotton brought from five to eight cents a pound. In other words, those were the days of economic distress and poverty, extreme poverty, in the South, and with all due respect to the doctor who preceded me who said the diet

in New York and Chicago is no more deficient in protein than the diet in the rural districts of the South, I beg to differ with him. In those days the people in the poor rural districts of the South lived mostly on corn bread, corn mush and other cereals which the cows did not need for their sustenance, and those were the days when pellagra was epidemic.

I remember in my days in the Vienna hospitals eighteen years ago cases of pellagra were treated in the clinics. These patients made an impression on me as representing about the last word in human distress and depression, and I am convinced in my own mind that the Goldberger theory and the results of the McFadden Commission have absolutely proved that pellagra is a disease of diet, due to deficient vitamins, vitamins which have not been separated, but which will be in the course of time now that we are on the trail of morbid lesions that are caused by deficient vitamins in the diet.

Dr. A. L. Levin, New Orleans, La.—We see a very large number of ameba cases in New Orleans, but I do not remember in the last ten years having seen a single case of amebic dysentery with a typical syndrome of pellagra. The few cases of pellagra I have seen did not have flagellates or ameba. The question of pellagra having a relationship with the excessive accumulation of carbonates in the body has been studied by careful observers at the Charity Hospital, where careful records have been kept. They concluded that in certain localities the water supply is at fault. If the water supply used by the pellagrin is alkaline, they advise the use of lime juice. The citric acid in the lime juice helps the elimination of carbonates from the body.

I saw a patient about three years ago with symptoms of gastric disturbance who showed an achylia. We could not determine the positive diagnosis, so we put him on Hcl. He improved and did not come back until four months ago. We made another test. This time he complained of several gastric symptoms, intestinal disturbance, looseness of the bowels, typical bilateral eruption on the hand which had started about a year previous; also a typical lesion on the neck. This time we made a diagnosis of pellagra which was confirmed by our dermatologist. He said no doubt the man was pellagrous and put him on the juice of four or five lemons a day, and it was remarkable that the skin lesion disappeared in eight days and there was improvement of the intestinal disturbance. From that I thought there is some relation between pellagra and a water supply which is rich in alkali.

Dr. Jelks (closing).—My friend, Dr. Knighton, I think has the cart before the horse with respect to achylia, as have some of my other friends. You get achylia in all of these cases and you get it from the condition. You get it because your patient is in the condition in which you always find achylia. You remember three or four years ago we had a cold winter, which I said would freeze out the bugs? That is the secret, and I prophesied it at the time. Have you not a society in New Orleans called the Vegetarian Society—people who eat no meat? How many cases of pellagra have they? If you show me a pellagrin among them I will have to back water some, not much.

The man who cannot make a diagnosis of pellagra until he finds skin symptoms is a poor diagnostician. I have seen patients who gave a very definite history of gall-bladder trouble, who were found to have pellagra. Someone said we do not have flagellates, and yet when you reach a certain point you find them. Dr. Somerville and I saw a case of a woman who had developed marked pellagra. He said he could not find any Cercomonas or Trichonomas. I said I did not believe he made the examination right, and I took my assistants out there and examined the woman and found her full of them. Today of course she is paralyzed but has no pellagra symptoms.

Dr. Witherspoon I do not doubt failed to find any parasites in the stools. Be sure the stool is warm and then do not depend on that, but depend upon your stained specimen and the chemical reaction.

Dr. Walcott spoke of flagellate infection. The resistance of a given subject will have much to do with that, but if you have severe flagellate infection you will certainly have symptoms, my friend Simon's opinion to the contrary notwithstanding.

A PROPOSED STANDARD TREATMENT FOR EARLY SYPHILIS*

By George Walker, M.D.,
Assistant Visiting Surgeon, Johns Hopkins Hospital,
Baltimore, Md.

Of course it is a recognized fact that no really satisfactory standard treatment of syphilis will be possible until we have a more accurate knowledge of the effects of certain drugs, such as arsenobenzol and mercury, and a clearer understanding of the nature of the causal organism, and the clinical course of the disease. Nevertheless, since it must be clear to any one who has studied the subject even superficially that the treatment in a large porportion of cases is irregular and haphazard, it would appear that a suggested outline of treatment, although defective in many points, might be of material value to those of us who are called upon to treat the disease and who have not had the opportunity of becoming thoroughly acquainted with the present status of the subject.

*Editor's Note: Dr. Walker spent twenty-seven months in France and was for eight months in charge of the Urological Section of the American Expeditionary Forces in Tours with General McCaw.

In the following standard will be found, so far as my studies enable me to judge, a combination of what is best in the methods employed in the various armies in France and by some of the leading men in America:

COURSE NO. 1

Days		
1.	Arsenobenzol intravenously	G. 0.6
	*Mercury salicylate into buttocks	gr. iss
8.	Arsenobenzol	G. 0.6
	Mercury salicylate	gr. iss
15.	Arsenobenzol	G. 0.6
	Mercury salicylate	gr. iss
22.	Arsenobenzol	G. 0.6
	Mercury salicylate	gr. iss
29.	Arsenobenzol	G. 0.6
	Mercury salicylate	gr. iss
36.	Arsenobenzol	G. 0.6
	Mercury salicylate	gr. iss
43.	Arsenobenzol	G. 0.6
	Mercury salicylate	gr. iss

Thirty days' rest.

COURSE NO. 2

Days		
1.	Novarsenobenzol	G. 0.6
	Mercury salicylate	gr. i
8.	Novarsenobenzol	G. 0.6
	Mercury salicylate	gr. i
15.	Novarsenobenzol	G. 0.75
	Mercury salicylate	gr. iss
22.	Novarsenobenzol	G. 0.9
	Mercury salicylate	gr. iss
29.	Novarsenobenzol	G. 0.9
	Mercury salicylate	gr. iss
36.	Novarsenobenzol	G. 0.9
	Mercury salicylate	gr. iss

Thirty days' rest.

COURSE NO. 3

One month, potassium iodid (Twenty-five drops of a saturated solution three times daily).

COURSE NO. 4

Repeat Course No. 2.

Thirty days' rest.

COURSE NO. 5 (TWO MONTHS)

First month: Potassium iodid as in Course No. 3, and mercury salicylate intramuscularly according to the following:

Days		
1.	Mercury salicylate	gr. i
8.	Mercury salicylate	gr. i
15.	Mercury salicylate	gr. i
22.	Mercury salicylate	gr. i
29.	Mercury salicylate	gr. i

Second month: same as Course No. 2.

Sixty days' rest, after which Wassermann and spinal fluid examination. If both are negative, no treatment; if blood is positive, begin with Course No. 5; if spinal fluid is positive, institute appropriate treatment.

Sixty days' rest. Wassermann. If negative, no treatment; if positive, begin with Course No. 5.

Ninety days' rest. Wassermann. If negative, no treatment; if positive, begin with Course No. 5.

One hundred and twenty days' rest. Wassermann. If negative, no treatment; if positive, begin with Course No. 5.

After the above is completed, Wassermann every six months and spinal fluid examination every twelve months for three years. If negative, no treatment; if at any time blood Wassermann is positive, begin with Course No. 5. If spinal fluid is positive, commence appropriate treatment.

The arsenobenzol (salvarsan) is recommended for the first period in order to get the maximum effect on the initial lesion, but if the physician is not conversant with the method of using the arsenobenzol, the novarsenobenzol may be substituted in the same doses as those employed in Course No. 2.

The novarsenobenzol may be dissolved in 2 c. c. of distilled water. This solution is stronger than is recommended by the manufacturers, but an experience of fifty-three thousand injections in France proved that it is safe.

The gums should be carefully watched and whenever the least trouble is found the mercury should be discontinued until the soreness has entirely disappeared.

*Gray oil may be substituted for the mercury salicylate, 1 c. c. of the oil representing 1 grain of metallic mercury.

A RATIONAL METHOD OF PRODUCING ANTIHUMAN AMBOCEPTOR IN RABBITS*

By George F. Klugh, B.S., M.D.,
Atlanta, Ga.

The use of antihuman amboceptor in the serum diagnosis of syphilis and other diseases is generally conceded to be preferable to the use of antisheep amboceptor, both on account of its greater convenience and accuracy. The most serious drawback with antihuman amboceptor has been the difficulty and uncertainty connected with its production by methods now in use. Practically all serologists advocate large doses of cells, increasing the amount with each successive injection. These methods were found by the writer to be accompanied by a high mortality rate whether the injections were given intraperitoneally or intravenously.

Experiments were then made and it was found that rabbits can stand with impunity any reasonable amount of cells given intravenously or intraperitoneally and any number of injections during the first ten

*From Laboratories of Drs. Bunce, Landham and Klugh.

days or two weeks following the first injection, i. e., until they become sensitized. However, during this time no amboceptor is produced. Finding amboceptor production dependent on anaphylaxis, further experiments have shown that the intensity of the anaphylactic reaction can be controlled by the size of doses given a sensitized rabbit. One cc. of packed human cells almost invariably kills a rabbit sensitized to human cells ten days or two weeks previously, while 0.5 cc. of packed cells kills such rabbits very rarely.

Exceptionally good amboceptor has been obtained by giving 0.5 cc. of cells intravenously to sensitize and a second intravenous injection two weeks later to cause anaphylaxis. It was found that very little amboceptor was produced until four days after the anaphylactic dose, being greatest about seven days after the anaphylactic dose. In view of these experiments the method here described has been used by the writer for the past two years with satisfactory results. About one-third of the rabbits give high titered serum, one-third medium, and one-third poor as would be expected by any method, due to the individual variations in the amboceptor producing power of individual rabbits.

METHOD

Select healthy young rabbits about grown. Males are preferable to females, since this eliminates pregnancy. Wash human cells until free of albumen and dilute cells to be used to 5 cc. with sterile normal salt solution. Injections are given in marginal ear vein with 21 gauge needle. For the first injection use 1 cc. of packed cells; second injection seventh day, 1 cc. packed cells; third injection, 14th day, 0.5 cc. of packed cells; fourth injection, 21st day, 0.5 cc. packed cells. Test bleedings for amboceptor titration should be made on the 21st day before giving the fourth injection. This last injection is usually not necessary as amboceptor has been made by the anaphylactic reaction of the third dose. If amboceptor is not satisfactory one week after the fourth injection, it is useless to give further injections. The second dose seems unnecessary but no time is lost by giving it, and doses one week apart allow ample time for sensitization before the third dose is given on the 14th day.

MALNUTRITION IN CHILDREN OF THE WELL-TO-DO: A REVIEW OF CASE HISTORIES*

By Charles Gilmore Kerley, M.D.,
Edward J. Lorenze, Jr., M.D.,
and
Roger H. DuBose, M.D.,
New York, N. Y.

In a review of our records of the numerous cases of malnutrition that have applied to us for treatment, we find the patients divide themselves into fairly distinct groups.

The type of case under consideration is one which is referred by the family physician, or brought independently, because the child remains persistently an inferior individual from a physical standpoint, sufficiently so to be the occasion of anxiety.

The patients were, as our records show, usually underweight, often underheight; they showed moderate anemia, and reacted unfavorably to their environment in comparison with their fellows.

In the majority, two features stand out most prominently. That of deficient food intake or imperfect digestion. It is not to be understood that the caloric value intake was necessarily below the requirements, as in one group it was usually in excess, and this refers to the first group, to which I shall call your attention.

GROUP I: MALADJUSTMENT OF FOOD ELEMENTS

Surround a child or the young of the lower animals with every favorable influence but a properly adjusted food supply, and defective growth is the result. This does not mean that the food supplied is scanty or not of good quality.

Osborne and Mendel have found that young animals may be fed up to their caloric requirements, and it is quite the same with the child. The child comes with the dietetic history of a rich supply of highly energized food, such as fats and sugars, given because they are underweight, thin, pale, and poorly developed.

Butter, cream, and 4% fat milk have been crowded. The use of sugar has been

*Read before the American Pediatric Society, Swampscott, Mass., June 2, 1921.

encouraged, usually malt preparations with cod liver oil have been used more or less generously. From a caloric standpoint the child has been fed far above his requirements on a non-growing diet. His appetite and capacity for the essential foods are greatly reduced.

The further history relates to poor appetite, habitually coated tongue, recurrent gastro-intestinal disturbances and constipation.

The essentials, meats, cereals, vegetables and fruits are taken indifferently and we have a true deficiency condition.

Management.—A child to thrive must have a healthy desire for food, and this we create by the withdrawal of fats and sugars in large measure. Three meals are given daily at five-hour intervals, and nothing but water is allowed between meals. A low fat and sugar diet is given and skimmed milk only is allowed. No cream or butter, if the child rebels at unbuttered bread a very scanty amount of butter may be given. From 16 to 20 ounces of skimmed milk is allowed daily. Sugar is permitted in sufficient quantity to make stewed fruits and puddings palatable.

Cereals, particularly oatmeal and corn meal, are given in large portions. Meats, poultry, fish, are given freely; vegetables are given twice daily and their use encouraged. Suitable raw and stewed fruits supply the desserts usually. Puddings containing milk and eggs are allowed sufficiently often to supply variety. Cod liver oil, malts and the inevitable iron is stopped.

One of our quite recent cases belonging to this group was a girl four years of age, weighing thirty-five pounds. In one month she gained five pounds on the above management. This child was made hungry, and demanded food for the first time in her life.

We can supply many case histories showing similar results.

GROUP II: HYPERACIDITY

In hyperacidity of the stomach juices we have an agency that causes defective food intake and malnutrition largely through the production of a poor appetite.

The chief symptoms of hyperacidity is a lack of desire for, or discomfort before or after taking food. The patient must be coaxed and bribed to eat. In cases of long standing, nausea and vomiting at irregular intervals is a prominent symptom. In the pain case the discomfort is greatest before meals, and the vomiting usually occurs in association with the first meal of the day. The pain may be of a colicky character, and fairly severe or only a feeling of discomfort may be experienced. We have studied by means of gastric analysis, 51 cases aged from 2 to 8 years. We have treated a great many others.

The test meal consists of a slice of white bread and a cup of very weak tea. In some of the younger children a weak oatmeal gruel is given.

A total acidity ranging from 30 to 138 has been found in 51 cases. The following method was employed in making these tests:

The Preparation of the Patient.—The child is wrapped snugly in a rubber sheet, primarily to prevent struggling and secondarily to prevent soiling of the clothing by vomited material along the sides of the tube and by the profuse secretion of saliva. The child is held firmly by the assistant.

After moistening the tube in warm water, it is passed to the posterior of the pharynx. Older children are asked to swallow, but in the younger it is necessary to pass the tube without cooperation. A certain definite resistance is encountered when the tube strikes the greater curvature of the stomach. Usually the evacuation of the stomach contents begins immediately. The flow is accelerated by coughing, crying, and vomiting. It is frequently necessary to begin the evacuation by aspiration. We find the Hess bulb satisfactory for this procedure.

Technic of Gastric Analysis.—Three separate portions of 10 c. c. of unfiltered gastric juice are placed in three small beakers. To the first portion three or four drops of phenolphthalein are added, and this is titrated with deci-normal NaOH until a deep permanent purple is obtained. The number of c. c. of deci-normal NaOH used in titrating is then multiplied by ten, giving the total acidity of 100 c. c. of gastric contents.

Three or four drops of alizarin are added to the second beaker and this is titrated until a permanent violet is ob-

tained, when the reading on the burette is made. Subtract this result from the number of c. c. used with phenolphthalein, as indicator. Multiply this by ten to obtain the amount of combined hydrochloric acid in 100 c. c. of gastric juice.

To the third beaker three or four drops of Troepfer's reagent is added and this is titrated until the red color disappears and a yellow color makes its appearance. The burette is read and the result multiplied by ten. This gives the amount of free hydrochloric acid in 100 c. c.

Results of Examination of Gastric Contents.—Of the 51 cases, 31 showed a total acidity of over 60; 25 showed a total acidity of over 70; 18 showed a total acidity of over 80; and 2 showed a total acidity of over 100. The two cases showing a total acidity of over 100 were those in which there was a food residue remaining from the meal prior to the test meal. Of the 20 that were under 60 the findings were as follows: 14 between 50 and 60; 3 between 40 and 50, and 3 between 30 and 40. We have come to look upon the normal total acidity as ranging betwen 30 and 40.

In the same series, we determined the amount of free hydrochloric acid in the gastric contents of 43 patients. Thirteen cases showed the amount of free Hcl to be between 1-10; 14 cases showed the amount of free Hcl to be between 10-20; 5 cases showed the amount of free Hcl to be between 20-30; 4 cases showed the amount of free Hcl to be between 40-50; and 1 case showed the amount of free Hcl to be between 50-60. There was but one case in which we found an absence of free hydrochloric acid.

Etiology.—Among the etiologic factors, candy, ice cream, irregularity as to meal hours and other faulty eating habits, figure prominently. It is with the rarest exception that the history of a hyperacidity patient does not contain the statement that orange juice was given on an empty stomach before breakfast. We have found that this type of patient responded usually to the dietetic regimen advised, which is as follows: Three meals daily suitable for the age are given usually with nothing between meals but water. In some a glass of milk is permitted in the mid-afternoon. Extremes as regards the temperature of the food and drinks are avoided. Condiments, candy, pastry and raw fruit are excluded. A powder consisting of bicarbonate of soda 2 gr., bismuth subnitrate 2 gr., and magnesium carbonate 1 gr., is given 15 minutes before meals. A daily evacuation of the bowels is arranged for.

GROUP III: DEFECTIVE GASTRO-INTESTINAL MECHANICS: DELAYED STOMACH EMPTYING

We have elsewhere in previous contributions called attention to the fact that poor appetite and defective food intake occurred in those who showed a stomach residue after four and a half hours. This condition we find in the ptosed stomach, which because of the changed relations of the pylorous to the stomach proper together with hypo-motility caused the delayed emptying. In the dilated stomach there is hypo-motility with like results. In such patients food residue has been found as long as 13 hours after a meal, and corroborated by the stomach tube examination.

In order for a child to have a normal desire for food there must be an interdigestive period of one hour.

We have also called attention to the fact that food retention is often due to pylorospasm, and that pylorospasm may be occasioned by an anomoly or lesion lower down in the intestinal tract. This is well demonstrated in the case of a boy 8 years of age in whom for two years there had been attacks of recurrent vomiting and who upon x-ray examination during a severe seizure showed a fairly persistent pylorospasm. For 11 days there was a persistent vomiting and a loss of ten pounds in weight. It was found that there was a direct association between the pylorospasm and a spastic colon and rectal constipation, the latter due to an over acting spincter ani.

The lower bowel was proven never to be empty. The pylorospasm was relieved by complete daily emptying of the lower bowel and the boy regained his original weight of 71 pounds in 13 days. The management of these cases is to make possible a normal food intake through relief of an over-acting pylorous depending perhaps upon anomalies of structure or derange-

ment of function further on in the intestinal tract.

In this group we have demonstrated ptosis and dilatation of the stomach. In the colon there has been ptosis, angulations, dilatations, sacculations. We have had five cases showing marked dilatations of the cecum. In the sigmoid elongation, sacculation and dilatation, we have demonstrated pylorospasm and spastic colon and hyper-tonic sphincter ani.

The malnutrition in this type of case must be considered from another angle and supplies a further explanation of the good results obtained when a normal digestive tract is established. Holt and Fales found in runabout children that the caloric loss was about 10% in well children, while in cases of severe chronic intestinal digestive disorders, the loss was at times as high as 25% of the total calories taken. They remark that in cases of severe chronic intestinal indigestion, the total food value loss in the stools must frequently be of much greater than 25% estimated, for in such cases there is usually a very large loss of carbohydrate through fermentation in the intestines. It is just this type of chronic gastro-intestinal disorder that is supplied by gastro-intestinal abnormalities, congenital and acquired, as demonstrated by the x-ray.

Management.—It is obviously quite impossible to outline a plan of management that will apply to all. One patient with a massive dilatation of the sigmoid, the result of adhesions, was operated upon successfully by Dr. William A. Downs. In the ptosis cases a snugly fitting abdominal belt with a pad or projecting shelf is worn for months.

In those with the dilated cecum, massage and liquid petrolatum has been successfully employed. In three cases stretching of the sphincter muscle was sufficient to secure relief from a persistent rectal constipation.

GROUP IV: UNDERWEIGHT, OVERACTIVE, ANEMIC, PRECOCIOUS CHILDREN

We now take up the most difficult type of our faulty growing patients. A comparatively small group to be sure, but it contains our greatest number of failures. I refer to the underweight, overactive, anemic, physically retarded precocious child, that we see only occasionally before the third year.

His food intake is low, despite the fact that the intestinal tract and the kidneys functionate normally. For this child I use the term borrowed from the stock farmer, that of "a poor individual," and we mark them 50, 60, or 70% individuals. In conversation with Professor Lafayette Mendel concerning this type of child, it was suggested by Professor Mendel that the deficiency might relate to a defective vitamin intake or defective vitamin utilization, and advanced the employment of yeast to supply such possible deficiency. A supply of dried brewers' yeast such as used by Osborne and Mendel in their studies on animals was obtained and kept in stock by a nearby apothecary.

We have used yeast in 125 cases in varying degree of malnutrition, not all belonging to the latter group, however, a careful analysis of the histories of the children upon whom it was used fails to show that it was of any benefit.

In fact we have had no signal success with group 4 patients. What favorable results we have had have followed a plan of rest cure, a curtailment of activities with school attendance delayed a year or two. As with the lower animal so with this particular type of child, it is apt to remain a poor individual. Occasionally they surprise us by developing into fairly substantial adults.

Dysfunction of the ductless glands. Endocrine gland therapy with the exception of the cretin has been unsatisfactory. We have used this kind of therapy freely and have failed to demonstrate its utility. Perhaps our technic is faulty.

Incapacity for the Digestion of Different Food.—Stools examination has been resorted to in many cases. When an incapacity exists it is usually for fats or carbo-hydrates and is readily corrected, except in those who have the so-called Caeliac disease of Gee.

Conclusion.—A large majority of our cases of faulty development relates entirely to food intake and utlization. For success in management we must supply the requirements.

THE ENDOCRINE SYSTEM IN INFANCY AND EARLY CHILDHOOD*

By Oliver W. Hill, M.D.,
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To the thinking physician, treatment does not consist merely in applying measures of relief. The essence of treatment consists in recognizing the pathological process, in understanding its nature, its cause, the mechanism involved in its production and in the development of its clinical manifestations, in knowing the character, extent, and probable outcome of the resulting functional and morphological changes; in valuing correctly, the significance of clinical and laboratory findings, in ascertaining the indication for, in knowing the action of, and the most effective methods of applying measures for its prevention, abortion, amelioration, or cure.

Eternal as the everlasting hills, metabolism goes on, the basis of life and all its phenomena, while men may come and men may go, like Tennyson's brook, it goes on forever. Species are cast in various molds, generations appear and disappear, youth is followed by age, yet through it all, running along on predetermined lines, goes metabolism. Where there is life, there is chemical reaction and regulating this, are the endocrine glands, the glands of internal secretion.

The review which follows, is intended to cover that part of the literature which especially concerns children. It was found very difficult to separate this from those pertaining to general medicine, and impossible to master all the literature in this fruitful field. It was necessary to leave out much excellent material in the review, for lack of space. I have also purposely omitted for the same reason, a discussion of the sex and glands of the kidney.

THYROID

By the intensive studies in endocrinology during the past few years, it has been established that the delinquent, backward and mentally defective child is the frequent end result of a disturbed metabolism produced by a derangement of the glands of internal secretion. In this disorder, as in others due to a disturbed endocrine system, it has been found that there is an intimate co-relationship between the different hormones, that generally no one endocrine substance is at fault alone, but that they are all involved to a greater or less degree in any disease which threatens the integrity of any one, causing thereby a change in the general metabolism. While it may be difficult to state just how much of the deficiency in the delinquent child is due to the thyroid hormone, it is the concensus of the opinion that, in the majority of cases of this type, hypothyroidism is the predominating pathological factor.

This is borne out clinically by the general response to specific thyroid treatment of certain similar developmental defects encountered in children.

It is believed by competent observers that the clinical and experimental evidence exists that the thyroid has bacteriorlytic and antitoxic properties.

L. Fasin, at Liege, by experiments on dogs and rabbits, found that the alixin was increased by the subcutaneous injection of thyroid fluid extract of the fresh gland.

The thyroid is the greatest stimulator to metabolism known, acting probably by the effect in increasing muscle tonus through nutrition of the autonomous nervous system. Experiments have shown that the thyroid has an undoubted influence on heat regulation. It also is a potent factor in the development of acidosis, by its influence in increasing oxidation. The thyroid, as you know, also stimulates the pituitary function.

Rachford says, in the whole range of medicine there is no more remarkable example of marvelous curative effect of a therapeutic measure than is furnished by thyroid treatment of cretinism. In this treatment we have a brilliant example of true specific medication.

H. Zondek, of Berlin, tells us that heart disturbances caused by hypothyroidism are characterized by sluggish action, and are benefited greatly by the administration of the thyroid treatment. These cases are marked by dilatation and do not respond to digitalis or other heart tonics.

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McKee, who has had an extensive experience with mongoloids, claims to have attained very good results with thyroid gland extracts.

The dangers attending the use of thyroid preparations depend, to a degree, upon the manner in which the remedy is administered. Beneficial doses, by raising the activity of all metabolic processes, prove tonic, increase the appetite, the strength, and the oxidations, as shown by a slight rise in temperature., When, however, the dose is too large, a weak, rapid pulse and shortness of breath, vomiting, cardiac oppression, a feeling of tightness around the chest, vertigo, and coma may supervene. Excessive doses have also caused anorexia, diarrhea, malaise, lassitude, and pain in the extremities; headache, various eruptions, urticaria, transient and papular erythema and eczema, and, in some cases, nervous manifestations; neuralgia, delirium, convulsions, aphasia, monoplegia, etc. When dried powder or compressed tablets that are not fresh are used, symptoms of ptomaine poisoning may be added to those mentioned. Hence, the observations that these preparations are more likely to produce such effects during the warm weather.

The best guide is the pulse. Any considerable quickening or palpitation should lead us to discontinue the drug until the cardiac action is again normal. There are no dangers in the use of the drug, provided we begin with small doses, from 1/20 to 1 grain, and gradually increase, watching the pulse. It should never be given to a patient who cannot be closely watched.

In some cases, although no other untoward symptom appears, the patient loses flesh. This is apt to occur when 2 grains of the dried gland is exceeded.

As to the length of time the patient shall take treatment, in many cases of hypotheria or atheria, it is necessary for a patient to follow treatment for years or for his lifetime. To be sure, all cases are not cured, but I think it is safe to say that all, when properly managed, are improved.

Dr. S. P. Beebe has used very effectively the human extract, when the animal has failed completely.

It is to be remembered that the dose of thyroid extract is relative to the patient. The dose, to be most effective must be large enough to stimulate metabolism, yet not large enough to cause an increase in catabolism. It appears that the usual dose recommended by pharmaceutical houses is much too large.

The preparations of desicated thyroid on the market vary in strength, so that a small dose of a weak preparation may be practically inert. It has not, as yet, been standardized. It is well therefore, to specify the same preparations at all times, correctly to judge the patient's tolerance. We have found that minute doses 1/20 to 1/10 grain three times a day, has been markedly beneficial to children suffering from infantile wasting, or to children which, for no demonstrable reason would not "grow off" as they should. We have them report at regular intervals, and watch them closely. The following is one of our cases:

Esther B. was seen on June 16 by my brother. Her general condition was good, her intelligence fair, her features inclined to be heavy; she had a noticeably short, thick neck. She was up to grade in school. Her weight was 46 pounds, her height 38¼ inches. She was put on thyroid extract gr. ½ t.i.d. Her height on the 25th day of October was 42¼ inches, a gain of 4¼ inches from June 16 to October 25. There was also a marked improvement in facial expression, etc.

We have also found small doses helpful in delayed dentition. But the most pleasing results have been had in mental deficiencies of different degrees and cause. Of course it is not effective in all cases, but you are amply rewarded for your labor by observing the results of even one successful case.

Chronic poisoning, characterized by rapid pulse, emaciation, weakness of the limbs, general debility, and mydriasis have also been observed in individuals who had undertaken, without medical advice, to treat their corpulency, and who had, therefore, subjected themselves to excessive doses.

Children bear thyroid preparations much better than adults and rarely acquire Grave's disease. The reason may be that their active thymus is able to neutralize the excessive or morbid activities of the thyroid gland.

The cause of the manifoldness of the hypothyroidal syndrome may be regarded as in the hyperthyroidal syndrome, as differences in the constitutions of the individual affected.

I will attempt no discussion of the relation of the thyroid and parathyroid, as it is still a much mooted question and time forbids any lengthy delineation of the different views.

Erdheim and his collaborators, on the basis of their investigations, adhere to the view that tetania infantum depends upon a hypoparathyroidism and that the artificial nourishment constitutes only an occasioning factor.

THYMUS

It has not been long that the thymus gland has been classed as a part of the hormonopoietic system. Originally it was regarded as a constituent of the lymphatic apparatus. The nomenclature is still influenced by this classification as evidenced by the following: status lymphaticus, status thymicus and lymphatism. The thymus gland developes as a paired organ from the ventrical part of the third branchial cleft. The pair unite very early. At birth the organ lies behind the sternum, backward as far as the pericardium, reaching above somewhat higher than the jugular notch.

The abnormality of the thymus that has attracted most attention is the phenomena called "persistent thymus" and which is supposed to bring about a train of symptoms.

The various conditions caused by an enlarged thymus are well covered by Pfaundler, who states that they are as follows:

(1) Tracheal stenosis.

(2) Pressure by the gland upon the circulatory system and nerves.

(3) Status lymphaticus.

(4) Laryngospasm.

(5) Dyscrasias caused by functional troubles of the gland itself.

Thymic Asthma.—According to some clinicians, enlargement of the thymus is a relatively rare condition. The conclusion is reached by lack of an examination. It is well to examine for a thymus in any case presenting these definite symptoms: dyspnea, continuous or remittent, suffocative attacks with cynosis and stridor. Very light or threshold percussion carefully employed in connection with properly executed x-ray work, using both the fluoroscope and photograph, will often demonstrate an enlargement of the thymus gland. I recall one case of thymic asthma seen in consultation, which had escaped the observation of some excellent clinicians. In this case throwing the head backward would cause a violent asthmatic attack. (Case seen by courtesy of Dr. C. J. Carmichael). It has been found that these cases can be markedly benefited by x-ray therapeutics.

This syndrome of enlarged thymus gland and attendant symptoms is sometimes termed status lymphaticus, and these are the class of patients which give the unexpected deaths under trivial hardships. The exact modus operandi of these deaths is not understood, and just what role hypothymization and pressure on the trachea, pharynx or pneumogastric, or what part they play is not decided. We do know that some of them respond well to skillful x-ray therapeutics. The information as to the physiological function of the gland is very meagre and uncertain, consequently any departure from the normal is very obscure. The influence of the thymus we know bears materially upon the osseous and skeletal formation.

SUPRARENAL

The adrenal glands are situated in the epigastric region on each side of the spine close to the upper pole of the kidney. According to Elliott and Armour the cortex of the suprarenal at birth is composed of a narrow outer rim of cells, from which develops the adult cortex. The adrenal glands receive a supply of sympathetic autonomous nerve fibers by way of the splanchnic. The active principle of this gland is epinephrin.

Garmendia tells us that suprarenal insufficiency may cause headache, with attendant symptoms, all of which are benefited by epinephrin, supplemented by recalcification measures.

In diseases where the patient demonstrates a low resistive power as in peritonitis, certain forms of pneumonia, diphtheria, typhoid, etc., when the temperature is subnormal, pulse weak, face dusky or livid, cold and clammy, there appears to

be some deficiency of the adrenal secretion. In diphtheria and peritonitis, investigators by necropsy have found this to be true. It has been suggested that epinephrin be used in these cases. These conditions are relatively common in children in almost any grave infection.

It has been found by Caro, Hoskins and others that the adrenals may be stimulated or excited by the thyroids. Adrenal insufficiency causes children to have the cold mottled skin to which mothers often call your attention, referring to it as "pieded."

It is a well known therapeutic fact that urticaria is sometimes relieved almost immediately by hypodermic injection of solution of adrenalin. Deficient activity of the adrenal due to inadequate development, exhaustion by fatigue, or any other factor, which without provoking organic lesions in the organs or their nerve paths, is capable of reducing secretory activity. Asthenia, accompanied sometimes by cold skin or cold extremities, hypotension, weak cardiac action and pulse, anorexia, anemia, slow metabolism, constipation, psychasthenia, are the many symptoms of this condition.

Adrenal function is of great importance in many ways. Bandler is of the opinion that it influences a child's temperament to marked degree, especially the emotion of fear which is fostered by education, and which, by the way, plays an important part in a child's life. I am sure that the study of the adrenals will bring forth some wonderful discoveries with reference to the growing child and give us a new weapon for the treatment of these unfortunate little ones which are such a problem.

We are told by Sajous, that a close study of the adrenal system would be productive of cures in many of our most fatal and distressing diseases. Many experiments lead us to believe that the adrenals supply, in some degree, the material for the antebodies which cause some children to be more resistive to infectious diseases than others. That there are degrees of deficiency of the adrenal secretions, is a familiar fact to most physicians, when the signs of this condition are brought to his attention. The ruddy, warm, hard romping youngster is not only well nourished but his skin is warm and red, being well filled with blood. His muscular, skeletal, cardiac, and vascular systems are strong because, in addition to being well nourished, they are well supplied by adrenal secretion, which investigators have shown sustains muscular tonus. The pale, flabby child, with cold extremities and capricious appetite, easily fatigued, apparently has a decided deficiency of the adrenal secretion which causes pallor by lowering the blood pressure. These children are of course more susceptible to disease.

Maranon has demonstrated that it is possible to induce all the phenomena of fright, such as pallor, dilatation of the pupils, acceleration of the heart beat, goose flesh, sweating, etc., without the intervention of the brain, merely by injection of epinephrin in artificially hyperthyroidized or in subjects with latent hyperthyroidism.

Recent investigations have shown that the status lymphaticus possesses a close relation to conditions of hypofunction of the chromaffin tissue. The great interest that clinicians and pathological anatomists demonstrate in this, is due no doubt to the fact that it is associated with sudden and unexpected deaths.

Jump, Beates and Babcok have collected from the literature, seventeen cases of precocious sexual development associated with suprarenal tumor, all of which were confirmed by necropsy. It is interesting to note that fourteen of the seventeen cases were girls. In all the cases there was an overgrowth of pubic hair; in fourteen of them, hair was present on the face; and in five there was axillary hair. Overgrowth of the body as a whole occurred in all. Precocious menstruation and breast development appeared in only one. The majority of the children showed diminished intelligence, but some appeared to be unusually bright. There seemed to be a tendency toward the assumption of the masculine type of the sexual development in all the females and an exaggeration of the normal in the sexual development of the males. The tumor always involved the suprarenal cortex.

Baldwin adds another case, a boy five years old, whose face was like that of a man and had been shaved for some time.

PITUITARY

The pituitary, like all of Gaul, is divided into three parts: the anterior lobe being typical glandular, the posterior resembling nervous tissue, the "pars intermedia" partaking of both kinds of tissue. Each of these portions produce one or more chemical substances or hormones, the function of which are not as yet clearly understood.

The large or anterior lobe produces a substance which regulates the osseous and muscular development of the body. The posterior is supposed to secrete a series of hormones, which play an important part in the metabolism, especially of carbohydrates.

In pituitary disturbances of childhood, the changes are marked, the skeletal growth may be stimulated or the stature may be small. There is the noticeable change of acromegaly and occasionally, acromicia.

Honax reports two cases of precocious adolescence and overgrowth which came to necropsy. In one there was a pineal tumor, in the other a marked disturbance of the pituitary gland. The clinical manifestations due to abnormal secretions of one or both these lobes, are taken as the chief guide for grouping of these disorders. The clinical syndrome, formerly termed "glandular" symptoms, are named hormonic signs and symptoms, a qualification applying to all endocrine disorders.

The hormonic signs and symptoms are defined as physical or metabolic changes, associated with other endocrine symptoms due to abnormal secretions of the ductless gland. These pertaining to pituitary disorders are divided into physical, metabolic, and other endocrine disorders. Among the general hormonic signs are the well known changes in osseous development, producing disproportion in the measurements, unusual development of the voluntary musculature, abnormal contraction of the striped muscle tissue, pigmentation and hair distribution. Among significant regional signs are, local changes in the head, nose, teeth, chin, hands and genitalia, localized adiposity, pigmentation, etc. Other important pituitary endocrine symptoms are polyurea, changes in the basal metabolism, especially carbohydrate tolerances, mentality, and other endocrine secretions, temperature, pulse and blood pressure.

However it is well to remember that the function of the entire pituitary body as well as the individual lobes is yet a matter of controversy, and will require much study, both clinical and experimental, for a clear understanding. While it is true that the secretions from the anterior lobe seem to have a definite effect upon the development and function of the osseous and genital system, it is acknowledged that other factors endocrinous and endogenous, undoubtedly, have a considerable influence upon both the growth and development of these two systems. Not all cases of retarded osseous growth and aplasia, for instance, can be attributed to hyposecretion of this lobe of the hypophysis.

Gigantism is supposed to be due to hyperpituitarism; it seems to be acromegaly of the period of growth. Here, organotherapy has been used with reported success.

There has been some wonderful work by surgical interference, but the efforts have been attended by such high mortality that very few evidently have the temerity to undertake it on a large scale.

There is conclusive evidence that the peculiar syndromes observed in children suffering from adiposity, attended by a striking mental torpor are markedly benefited by the administration of pituitary gland. A beautiful example of this is the case reported by Dr. Talbot. In this instance the whole gland was used. Another class, of mental deficiency, one of which was reported in detail by Dr. Haynes, was observed by Drs. Haynes and Kerley for some months, and the results obtained were very satisfactory. This child responded promptly to glandular therapy. The gland used was pars intermedia.

GENERAL SUMMARY

It is a well known fact that such diseases as Addison's disease, exophthalmic goiter, myxedema, acromegaly, are attended with abnormal psychic phenomena in a great many instances. But mere deficiences of functional activity, independent of any active pathology in any one of the ductless glands, may inhibit the nutrition of the brain to such an extent that they

produce various forms of idiocy and mental backwardness.

It seems to be characteristic of some families to have a well balanced endocrine system and others have a poorly balanced. These may be demonstrated in a decided tendency to hyperthyroidism showing all the traits of Basedow's disease. As our knowledge grows, these will be explained to a great extent and finally be classified as curable instead of neurotic or hysterical, both of which to my opinion are meaningless. With this wonderful and in some respects unexplored world of medicine, we may find much to balance these unstable and unfortunate individuals.

We are only on the threshold of knowledge of relations of the ductless glands to each other or the clear understanding of the endocrine system, the great role it plays in the development of the growing child, both physically and mentally. But the possibilities are vast for therapeutic measures.

Heredity plays a great part in endocrine dysfunction; as proof we cite you to families who are underdeveloped either physically or mentally, or both. Of course, toxemia and other perverted psychological processes and environment influence these conditions. But mental ills should now be considered just as much as physical ills and when possible, diagnosed.

There is such a close hormone relation between the whole endocrine system that it will require much work on the part of both the laboratory investigators and the clinicians to clarify the situation to the extent that we can say in a given case, that it is this or that gland which is at fault, whether the secretion from the ductless gland is influencing a gonad or a gonad influencing a gland, etc.

In administering ductless glands, one must admit that preparations are abnormal to begin with. The glands used are dried and only the hormones that are relatively stable can be preserved. Even here, we have no absolutely certain method of checking our findings and must usually reason by inference and deductions in the interpretations of results. However, we are on reasonably safe ground when we can by administering preparations of a particular gland, prevent the occurrence of symptoms that would otherwise result from the extirpation of the gland in question.

It is well to remember that much of the rapid advance of the knowledge of the endocrine system has come about through clinical observation. It is not my intention to belittle the significance of what has been brought to recognition through experimental pathology. This alone has made possible the rapid advance of the clinical side.

Dunn thinks there is an unfortunate tendency in modern medicine to ascribe a great variety of functional disturbances of obscure pathogenesis to a disease of some of the ductless glands, bringing about an indiscriminate prescribing of the glandular extracts for obscure conditions in early life. I heartily agree with him in the extreme, but believe that a closer observation of a patient with discreet and intelligent prescribing of these glands would be of great benefit to the patient, as well as clear up many unsolved problems of medicine. Certainly there is some grasp somewhere to the great system that is so potent a factor in the physical and mental well being of mankind.

Time and space do not permit the consideration of such well known phenomena as cretinism, myxedema, Grave's disease or Addison's disease, etc., except to incidently mention, but to invite your attention to the less observed and more obscure manifestations of the endocrine system.

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DISCUSSION

Dr. C. E. Boynton, Atlanta, Ga.—The trouble in dealing with endocrinology at all is that we are liable to become entirely too enthusiastic about it. Personally I believe that the enthusiasm is more than justified. I have been very much pleased in the past year to see the wave which has gone over the country in regard to these endocrine cases. If the general profession continues to be as interested in endocrinology as it has been in the past few years, we are going to know a great deal more about it than we do now. Very few of us are sure whether we know anything about it or not. The fact that the secretions of the glands involve the entire body is true beyond question. We know they make a child grow and develop and if they are absent, this does not occur normally. We know that if they are normally present the child is intelligent; if they are deficient he is not intelligent.

I have been dealing with mentally and physically defective children from an endocrine standpoint during the past few years and have been greatly encouraged by the results. There are many other types of cases which are benefited by gland therapy. At present I have a boy of about ten or twelve years who had been treated by a number of physicians for epilepsy. What epilepsy is I do not know. I know the symptoms. On making a careful examination I also found that the fat distribution on his body would indicate that he had a hypopituitarism. The boy was more or less wrecked from the various treatments. I stopped all bromides and put him on hypopituitary treatment. He was an out-of-town patient and on the way home had a convulsion. That was six months ago, and so far he has had no more convulsions. Now during that six months the boy has changed in shape. The breasts, which were as large as any fifteen-year-old girl's, have been markedly reduced. The excessive collections of fat about the lower abdomen, pubes and hips have about disappeared. In other words, the treatment for hypopituitarism has changed this boy and during the change there have been no more epileptitc convulsions.

Dr. L. R. DeBuys, New Orleans, La.—The study of the functions of the endocrine glands is extremely interesting but our information at this time is very wanting. There may be many reasons for this and possibly one may be advanced that because of the complexity of the symptoms produced and the intimate relations of the glands to each other in their function a definite picture may probably be masked.

There is one thing which has occurred to me in connection with the endocrine system and it is this: that patients with endocrine disturbances as we know them at this time are usually not born with them. We may counterdistinguish them from those conditions which are present at birth and which have not been shown to be due to any endocrine etiologic factor, as for example, achondrodysplasias or Mongolian idiocy. A case of endocrine disturbance usually does not show the symptoms at birth, when he is apparently normal, but the symptoms come on later. It is possible that the fetus may be protected through the placental circulation before birth and it may be possible that during the period of lactation the child may receive some substance from the mother to protect him, as it is usually after this stage that we find these conditions developing. It is necessary, therefore, that we should be familiar with the normal growth and development of the child and it is possible that with a thorough knowledge of the normal growth and development we shall be able to recognize the abnormal. With the advance in our knowledge of the disturbances of the endocrine glands we should be able to recognize earlier the symptoms so that by the early instituting of proper treatment we may hope to prevent the tragic pictures later. To illustrate, we know in instances of the cretin, the earlier the existence of the condition is recognized the nearer the normal can we make the ultimate individual. On the other hand, if cretinism exists for a prolonged period not much can be done.

Dr. Hill has covered the symptomatology very thoroughly. We should always bear in mind with the symptoms as he has presented them the possibility of an endocrinopathy existing in the individual. We should, therefore, be careful in our clinical observations to recognize the cases early, be sure that we are right, treat them properly, then expect results. Unfortunately the results that have been recorded have not been as good as they might have been. The lateness in instituting the treatment may in a way be the cause.

In closing, however, I want to sound a definite warning in connection with the administration of things we know very little about. We should be reasonably sure of the diagnosis before introducing into any human being products of the endocrine glands.

Dr. A. A. Shawkey, Charleston, W. Va.—I want to ask one question. Dr. Barbour in his clinic the other morning spoke about the thymus as a factor in acidosis. Personally I recall one child who had a very marked ammoniacal urine from birth, which was unchanged by treatment both medicinal and dietetic. An enlarged thymus gland was found and x-ray treatments begun. The first x-ray treatment reduced the ammoniacal urine and it was further reduced by the second treatment. Notwithstanding that the man giving the x-ray treatments said the gland was not reduced by the treatments, the symptoms disappeared after the second treatment. I have never

heard this feature discussed and should like to ask the speaker to discuss it if he has had any experience with cases of ammoniacal urine apparent of thymus origin.

Dr. P. F. Barbour, Louisville, Ky.—The subject of endocrinology has opened up to us a greater field for our study and has taken a step further in the profound mysteries of life. Heretofore, we have traveled along the surface of things and have treated a great many diseases, which the child is subjected to, and sometimes we come to the realization that these fundamental things affect life in a way that we have not sensed. Those of us who have handled many children have many of those unfortunate diseased ones with defective mental development. We realize that we have to go beyond the order of routine of practice and treatment, when the ordinary remedies do not give us results.

The men who put endocrinology on the map, as Dr. Hill has said, perhaps were cranks, but it takes a crank sometimes to wake up the profession and make them realize that there are diseases that the profession know very little about. To say that endocrinology is a complicated subject is true. Anything that affects the foundation of life, and has to do with the deeper physiology of life must be complicated, and so endocrinology is not a simple subject and I think we have merely scratched the surface. When we learn that the pituitary glands have nine different functions, any one of which may be increased or diminished and only one of which may have its effect upon the function of other glands, you can understand at once that the subject is a very complicated one, and one that is very difficult to unravel.

Our attention should be called to the major disfunctions of these glands. I had the opportunity of showing you in the clinic, several definite cases of gland disfunction. These cases were very interesting to me because they represented several different types of trouble, but if we have to wait until we get a distinctive type of cretinism and pituitarism, we will likewise have to wait for an exact type of pneumonia or typhoid fever. We must know that the functions appear in minor or modified form, though many cases of thyroid disturbances are not true cases of cretinism. If you make the proper diagnosis, you can often secure better results by the treatment. If you take a child like the little one I exhibited, who is 14 years old, you cannot now build her into a perfectly normal child, but I think if we had had the opportunity of taking care of her early in life, and recognized this condition when she was a year or two old, we might have accomplished a great deal for her.

Dr. De Buys says these cases do not show evidence of trouble early in life. I think that this is because we have not been on the lookout for them. We are sufficiently familiar with the manifestations, and I am sure with more experience along these lines, we should be able to recognize these very early disturbances. I also think, though I cannot prove it, that many endocrine gland disturbances will be found to be among the imperturbable types of disease.

Dr. Alice Pickett, Louisville, Ky.—You may be interested to hear of three obstinate cases of enuresis which were successfully treated with thyroid extract at our Children's Hospital. During my service there last winter we had our usual rather large percentage of enuresis cases to deal with. They were treated along the classic lines, by the giving of atropin solution, care as to diet, the cutting off of fluids after 4 P. M., etc. Out of the number there were three that did not respond. These were cured by the administration of thyroid extract.

We attributed our success to the improvement in general nutrition, brought about by the action of the thyroid, with consequent increase in the mascular tone of bladder and spincter. All the children were over four years of age, and in no case was the dose more than one-tenth of a grain.

Dr. W. W. Harper, Selma, Ala.—There are one or two points I wish to emphasize. We must recognize these cases early. I think we should carry in our minds what a normal child should do—when a child should hold up his head, when he should begin to notice things, when he should reach out for something, when he should begin to talk. When a child fails to do those things which he should do normally, we should begin to search for the cause. For instance, a child does not sit alone at six months, and was unable to hold up its head at four months. A careful examination may show other evidences of cretinism and by instituting early treatment the child develops normally.

Another thing is the difference between diseases of the cortical portion of the adrenals and the pituitary. In diseases of the cortical portion of the adrenals the child grows very rapidly and has abnormal sexual development. For instance, a boy of two years has the anatomical development of a child of five or six years, and his sexual development is that of a boy of 16, 17, or 18. He talks just as a boy passing into adolescence. If the pituitary, on the other hand, is at fault, you have a marked skeleton growth but a real atrophy or shrinking of the reproductive organs. By bearing this in mind, in many cases we shall be able to make a differential diagnosis between diseases of the adrenals and the pituitary gland.

Dr. H. M. Austin, Laredo, Texas.—I wish to speak of one point that Dr. Hill brought out, the use of adrenal extract in urticaria. I have used the endocrine gland extract for several years more or less empirically, but I had not read that adrenal extract would have a marked effect on urticarial conditions. I have found that to be so and also that with the addition of pituitary extract the effect was very much more marked and very much more lasting.

Dr. Hill (closing).—The object of this paper was not to call your attention to these things that I mentioned, but to stimulate the study of the more obscure conditions.

Dr. De Buy says he does not think these conditions are congenital. I believe they are in some instances congenital. I recall one cretin mother in our institution whose child was a typical cretin. The child was recognized at a month old. Someone suggested that we give thyroid extract to the mother. We did so with marked benefit to the child.

As to the tests that are used to find the disfunction of these glands, there are a number, some of them very accurate. You can find these in the literature on the various glands.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

X-RAY AND RADIUM AS AN AID TO SURGERY IN DEEP SEATED MALIGNANCIES*

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By a deep seated malignancy, we mean any malignant condition, regardless of its origin whether deep seated or superficial, that has extended until the deep tissues have become invaded, or until metastasis has occurred at some other point in the body.

A very great advance in the treatment of these conditions has been made within the past few years due to the perfection of the Coolidge tube and to the apparent magnificent results now being obtained in some cases with radium. A great number of these cases who come to the surgeon, do not reach him until the case is very far advanced, or many times inoperable and occasionally absolutely hopeless. I regret to say that in many instances, we are told by these "condemned" individuals, that some physician has told them "that it was the change of life, or not to bother about the lump or tumor until it troubled them." Our attention has been attracted by the great number, comparatively speaking, of these patients now applying for treatment. Out of the 907 surgical cases in Dr. Haggard's clinic during the year ending March 31, 1920, 76 were deep seated malignant growths treated surgically, 12 others received x-ray treatment only, the most of whom had had surgery elsewhere and came to us with recurrences. Besides these 37 others received radium treatment alone, most of whom were inoperable surgical cases, while 9 others were turned away as utterly hopeless, making a total of 134 cases, which compared to the surgical work for the year gave us a percentage of about 14, or about one in every seven cases coming for surgery were deep seated malignancies.

Of the 9 cases turned away during the past year, 3 were breasts, 2 were mouth, and 1 each of the shoulder, leg, lung, and cervix. Two of the breast cases had lung metastasis as shown by the x-ray, hence the importance of a good skiagraph of every breast case before operation, and also of every case of sarcoma because of its proneness to metastasize in the lungs. One of these cases had no operation while the other had had a Halstead operation by Dr. Haggard seventeen years ago. Had this patient had post operative radiation of the chest, I do not believe she would ever have had a recurrence. The other breast case had a glycosuria and a blood pressure of 245, along with advanced glandular metastasis and of course was hopeless. The two mouth cases, one primary and the other a recurrence from operation elsewhere, had such extensive metastases that both were hopeless. The lung case was a primary one in a boy seventeen years of age and of course could not be benefited, while the cervix case was an extensive cauliflower carcinomatous growth which completely filled the vagina, having recurred a second time, the two former operations having been done elsewhere. The shoulder case had an extensive lung metastasis while the leg case seemed too far advanced to be benefited by any method of treatment.

In this paper I wish to report in a general way some results in the 320 cases that have come under my observation as an associate of Dr. Haggard during the past four years since we began the use of the Coolidge tube in connection with surgery, as well as the use of radium in some of these cases.

*Read in the Section on Surgery, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

In approaching this subject we believe it not amiss to glance back a few years and see just what was happening in these cases before the improvement in the x-ray or the advent of radium.

It was then that surgeons did not expect much from radiotherapy. They recommended the treatment mostly because there was nothing else to do, and partly because they did not wish to deprive the patient of the possible chance of a cure which this treatment might accomplish, for we did not know then, nor do we even yet fully appreciate its possibilities. The pessimism of the surgeon was in a very large measure justified because statistics in the past had shown that deep seated malignancies have rarely been permanently benefited by roentgen rays or radium treatment. But this did not indicate that they never would be or that we should give up in despair, but instead that we should increase our efforts and improve our means to crush this most malignant foe of mankind.

Twenty-five years ago removal by knife was considered the only legitimate method of treatment, regardless of the type, location or stage of the disease. If the case was inoperable, nothing was done or else an operation was performed for palliation. But it is gratifying to know that all the better surgeons today realize that operation is seldom if ever indicated for palliation, that even in the early cases, cutting out the center of a malignant growth never retards but hastens its progress. A few careful observers even advise anti-operative radiotheraphy and nearly all are beginning to advise post-operative treatment.

Until lately only the hopelessly inoperable and recurrent cases were referred for radiation, but now we are getting border line and more favorable cases and hence we are obtaining far better results clinically. We should be careful, however, not to make over-enthusiastic and unwarranted statements. Whatever the method of treatment of cancer, conservative statements but radical methods of treatment are advisable. I am firmly convinced that both radium and radiotherapy will in the future increase their usefulness in the treatment of malignancy and we must keep working unceasingly on the problem. Many cases have been and can be cured by the different methods singly, but usually the physician or surgeon in the past, advised the method with which he was most familiar instead of selecting one or the combination that would yield the best results.

Mastery of all forms of radiation is the first essential in efficient treatment of the various forms of malignancy. Each form of radiation has its place. Radiation should not be used when operation is indicated any more than a surgeon should cut out the center of a cancerous growth and expect radium or radiation to do the rest. Such practice brings both the surgeon and radiotherapist into disrepute because the profession is rapidly learning that each has its place. Many contend that radiation from the roentgen tube and radium are the same thing; but we know this is only partly true. There is a difference in the physical properties between the two forms of radiation as well as somewhat different physiological actions on both diseased and healthy tissues. In many instances, those using only the roentgen rays will say that all can be accomplished by this form of radiation that can be accomplished by both radium and x-rays, while those who employ only radium make a similar statement for this agent, or may even say that radium alone is superior in all cases where radiotheraphy is indicated. Such statements show that the radiotherapist is not familiar with both forms of radiation and has not treated a large number of cases by both methods.

Comparing the two sources of energy we would say that radium is the most powerful form of radiation that we possess when applied locally to malignant growths.

The value and limitations of radium when used alone or when applied with other agents must define its present place in medicine. In radium institutes it is being employed in the hopeless cases and in many cases it is employed alone when better results would be obtained if it were combined with roentgen rays for extensive metastasis or with surgery following the removal of the malignancy. In private practice there are a few men using

radium intelligently and conservatively, but a number are ultra-enthusiastic and apply it in every case of malignancy regardless of the extent or nature or location of the disease.

Roentgen rays on the other hand offer us a cheaper form of radiation whose source is practically without limit when coming from a Coolidge tube, but whose hard rays are about as penetrating as the softer gamma rays of radium and can be placed at such a distance from the cancerous cells that a much larger area can be covered, which is preferable when metastasis has occurred. Unfortunately, roentgen rays have been adapted in so many varied forms of practical usage, particularly in making diagnosis, that it is not surprising to find them used in other applications by persons entirely ignorant of their physiological action and unfamiliar with the clinical history of malignancy. Beneficial results obtained in this manner by a physicist or technician or the novice in x-ray therapy can be scarcely other than accidental. On the other hand, great harm can be done these cases by such treatment, as they almost invariably receive only stimulative doses.

It is generally conceded that it is the rays which are absorbed in the tissues and the secondary radiation set up therein that produce the changes in the tissues. The difference in the physiological action between radium and the roentgen rays may be due to the beta rays which radium gives off, or it may be that the gamma rays from radio-active substances set up more intense secondary or beta rays than those from the roentgen tube. However, radium and roentgen rays are closely related in their action on tissue and should be discussed together.

In order to produce tissue changes by either agent it is necessary that sufficient quantities reach the tissues to be treated and that they do not destroy adjacent healthy tissue through which the radiation passes.

When a tube of radium is brought into contact with a growth a certain dosage will inhibit proliferation of the new growth cells, and will finally cause necrosis of the cells nearest it, while farther away from the tube the same kind of cells may be only stimulated. Therefore, there is a limit through which the rays can penetrate healthy tissue, destroying malignant cells, without injuring the healthy tissue. It has been demonstrated that when radium is placed in contact with a cancerous mass the malignant cells can only be destroyed for a distance of from one to about one and one-half inches from the radium tube. By cross firing this can be increased somewhat, but will not take the place of the source of energy which is placed at from eight to ten inches away as is the custom with the Coolidge tube.

Radiation to the depth of from one to one and one-half inches is sufficient to destroy many malignant growths, but it will not reach the outlying cells in the lymphatic glands. Deeper effects can be obtained by placing the source of energy at a distance from the mass and by cross firing, and it has been demonstrated that with the source of energy at eight inches from the surface by treating through seven ports of entry a tumor four inches below the surface would receive about the same amount of radiation as the skin would receive over any one particular area while a growth five to six inches below the surface, for example, a cervix or uterus in a large woman, would require eight to ten portals of entry to get the same results. It has also been demonstrated that carcinoma four inches below the surface will not be much affected by less than this amount of radiation, while a sarcomatous mass would probably be reduced in size by from one-third to one-fifth of this dosage. Then since most malignant cells are about two to five times more susceptible to the destructive action of the rays than normal tissue cells, it is possible to produce clinical retrogression of malignant growths and even within the lymphatic glands to destroy them at some distance from the surface without destroying the overlying skin.

It has also been demonstrated that the action of the rays varies considerably with the type of disease under treatment. For example, it requires considerably less radiation to destroy sarcoma than it does to destroy carcinoma. This could be illustrated by treating lympo-sarcoma of the cervical glands where there is a large mass and in treating carcinomatous

glands which have metastasized from the lip, tongue, throat, face or scalp. The large sarcomatous mass will disappear much more quickly than the small carcinomatous mass. We also find several other peculiar characteristics of the different types of the same disease. The lympho-sarcoma is much easier than the melanotic form while a giant cell type is easier to cure than either the spindle or small round cell type. We also note that the scirrhus type of carcinoma is the easiest form of this disease to cure, while it requires from two to four times more radiation to cure the squamous cell carcinoma of the mucous membrane. The lip and the cervix require much more radiation than carcinoma originating in the skin. The vagina will tolerate from five to eight times more radiation than the skin over the abdomen. This alone should induce any clear thinker not to attempt to destroy local carcinoma of the cervix or uterus by x-ray through the abdomen, as many roentgenologists are doing when radium is available. Sarcoma, for example of the bone, is much more resistant to the rays actions than are the sarcomata of the lymph glands.

There are many things to take into consideration in the treatment of any malignant condition. The first thing one must carefully consider is the primary growth, whether it can be completely removed and whether sarcoma or carcinoma and of what type in either particular case. The second important consideration is the avenues by which metastasis takes place, and the third important consideration should be of the location in which metastatic proliferation of cells is likely to occur. Unless all three of these danger zones are known, carefully considered and vigorously treated, no method of treatment can ultimately be successful except when the primary growth is discovered and attacked early before metastasis has occurred and all malignant cells can be removed or destroyed. This of course should be the rule in these cases, but unfortunately in our experience it has been the exception, as we had a very large percentage of frankly inoperable cases, while many others were fruitlessly explored.

In this series of cases none are reported in which the diagnosis was not confirmed by the microscope or in a very few instances either by the clinical course of the disease or at the post mortem.

Our series of cases were divided as follows: breast, 67; cervix, 64; lip, 23; uterus, 17; stomach, 15; ovaries, 13; rectum, 13; jaw and mouth, 11; prostate, 10; cervical glands, 10; kidneys, 7; chest wall, 7; face, 6; tongue, 5; thyroid, 4; retroperitoneal, 3; liver, 3 (one being primary gall bladder); antrum and nose, 3; testicle, 3; labia, 3; parotid, 2; submaxillary gland, 2; frontal area, 2; pancreas, 2; upper thigh, 2; knee (sarcoma), 2; small intestine, 1; appendix, 1; bladder, 1; buttock, 1 (following extensive burn in childhood); upper arm, 1; hand, 1; shoulder, 1; leg, 1; tonsil, 1; umbillicus (primary), 1; lung, 1; total, 320.

The breast, cervix, uterus and ovaries were the seat of the disease in 161 of these cases, which is a little more than 50 per cent of all malignant cases.

The breast constituted the largest single group. The left was involved in 40 cases compared with 27 of the right. Thirty-two of these 67 cases had axillary involvement, five did not. In the remaining cases this point was not mentioned in the records. Fifty-two of the cases had Halstead operation, while five only had amputation of the breast. Five others were inoperable and the remaining five had had surgery elsewhere and came for radiation or with recurrence. Of the 64 cervix cases 42 or 65 per cent were inoperable, 20 of whom received radium and 22 the Percy cautery, 3 of these later having hysterectomnies. Twenty others had hysterectomies primarily while the remaining 4 had amputations only, 2 of which were followed by radium.

Of the 17 uterine cases, most of which, while not specified, were evidently primarily cervix, 3 of which were sarcoma, 15 had hysterectomies while 1 had multiple fibroids for which myomectomies were done and microscopically proved to be sarcoma and recurred rapidly; the remaining cases were inoperable at exploration.

Of the 13 ovarian cases, both ovaries were involved in 9 instances. Four were sarcoma and 4 were inoperable. One of them, in an elderly lady, was a bilateral

carcinomatous involvement, metastasizing in the bottom of the pelvis with a very large amount of free, clear fluid, which was evacuated. The patient was given enormous doses of x-ray through from eight to ten portals of entry at each treatment over a period of sixteen months. At each treatment from one to three gallons of fluid which finally became quite white and thick, resembling chyle, were withdrawn from the abdominal cavity before the treatment was given. This fluid finally ceased to form and this patient remained well and free from discomfort for more than two years although she was an inoperable case in the beginning. The other nine cases had both ovaries removed at operation and in two instances rapidly recurred during the patient's stay in the hospital. One of these was a carcinoma in a fleshy, middle aged woman. This patient was also given enormous doses of Coolidge tube rays over a period of eighteen months and despite the fact that the recurrent mass was at least five or six inches below the skin surface, it was made to disappear temporarily and the patient lived in comfort for about three years. The other was an infiltrating sarcoma of the left ovary and broad ligament some months after labor in a woman only 26 years of age who was operated upon in May, 1916. This patient was also given massive doses of rays over a period of fifteen months and is now perfectly well. Dr. Haggard remarked on this case, "If I had not seen this ovary at operation and had not had a microscopical report of sarcoma on it I could not have believed such a result from the rays possible," as this enormous recurrent mass rapidly disappeared under treatment and this patient remains well at the end of four years. This patient had a considerable burn of the skin over the abdomen which did not break down until about four months after treatment had been stopped. But this has long since healed and we feel that our efforts were entirely justifiable in her case.

Of the 15 stomach cases 7 were inoperable and 2 others were advised against operation. One of them went elsewhere and had an exploration. Six cases were resected, one of whom died at operation and two others have since died. The other three resections are known to be free of trouble. Two of them had extensive x-ray treatments, one being well for more than three years.

Seven of the 13 rectal cases were inoperable and an eighth one came in with a complete intestinal obstruction as a result of an undiagnosed rectal cancer. More than 50 per cent of these cases failed to have even a reasonably early diagnosis which should have been in these cases comparatively easily made, or they had failed to take advantage of early advice from their physicians. Four of these seven inoperable cases, one a boy 17 years of age, received marked temporary benefit from radium, while another was only explored and the two remaining ones had colostomies for temporary relief. Five other cases had Kraske operations, only two of whom are known to be dead now, and the remaining case died from the colostomy which was done for the relief of the obstruction.

Four of the ten malignant prostates were inoperable. Two of them had radium, and one is apparently well now at the end of nearly a year. One died from exploration while one went elsewhere and had an exploration. The six remaining ones had prostatectomies, one of these died at operation and two others are known to be dead since. One was 60 years of age, and had a very extensive mass at operation, so much that we were only able to remove a portion of the gland for the relief of his obstruction. This patient had massive doses of x-rays over a period of thirteen months and lived in comfort for most of the time for more than two and one-half years.

Of the 10 colon cases five were in the sigmoid, two being inoperable and two (one with complete obstruction) died following resections, while the fifth one had a Mikulicz's operation followed by heavy radiation with x-rays and is living and well now at the end of about three years. In three of the colon cases the cecum was involved, two being inoperable and the third being resected. One of these inoperable cases was in a young man 24 years of age whose abdominal tumor entirely disappeared after four x-ray treatments. He refused to return for further radiation and had recurrence and died at the end of

about one and a half years. One case occurred in the splenic flexure while the remaining case had the hepatic flexure involved and was resected and remains well under x-ray treatment.

Nine of the 11 mouth and jaw cases apparently had the primary involvement either in the mucous membrane of the buccal cavity or on the alveola process, while two of them were sarcoma and involved the inferior maxillary bone. One of them did not have operation. The other one, in a man 40 years of age, was resected. This patient returned to us at the end of three years with an enormous recurrence even much larger than primarily, stating that the recurrence had existed for two years. At a secondary operation we resected the entire remaining half of the inferior maxillary bone, the recurrence having taken place in the upper remaining portion of the bone. This was followed by heavy radiation over a period of fourteen months. This patient has remained well now for more than three years.

Of the 23 lip cases proper, 20 occurred in the lower lip. While it is not always so regarded, cancer of the lower lip, especially when of much duration, is an extremely serious condition because of its tendency to early metastasis and because of the great network of lymph vessels leading away from this particular area of the body. Many of these cases had metastasis when we saw them and others had recurrences following resections elsewhere. Some of these cases had extensive surgery especially of the glandular region, some had x-ray and some had radium; the most of them had two or more methods combined with varying results. There is an anastamosis between the deep chains of lymph glands on the two sides of the neck as they drain away from the lower lip, and owing to this fact we may have a metastasis occurring in the left side of the neck when the right lip is involved, and vice versa. I believe that this anatomical condition often explains the fact that so many physicians who attempt to treat these conditions are quite surprised when they see these metastatic conditions occurring. If the condition has existed for any length of time both sides of the neck should be treated.

Five of the seven malignant tumors of the kidney had nephrectomies. One was only explored and one advised against operation. One of the nephrectomies was a very interesting case in a boy 18 years of age who came with a very large mass in the upper left abdomen. The kidney was suspected, but owing to the size of the tumor the anterior incision was made, and we found a very large and extensive malignant left kidney. In fact it was so extensive that it could not be removed. This patient was given heavy radiation over a period of fourteen months. The tumor disappeared even to palpation and the patient remained symptomatically well and at work for fifteen months, but fearing a recurrence we advised a nephrectomy. Because of the extensive fibrous leathery adherence of the kidney to all surrounding tissues a great amount of traumatism was necessary for the removal of this kidney and the patient died of shock at operation. The kidney was nearly as fixed as if it had been surrounded with concrete.

SUMMARY

Of 320 cases seen, 16 were turned away and 304 were treated, 116 cases had surgery alone, 19 others had exploration only, and 102 or about one-half of the remaining cases had surgery combined with x-ray. Thirty-four cases had x-ray alone, 11 of whom had surgery elsewhere. Twenty cases had radium alone, 11 of these being cervix and 4 being rectal cases, while the remaining 5 had had surgery elsewhere. Sixteen cases had x-ray combined with surgery and radium, while 11 cases had surgery combined with radium and the remaining 5 cases had radium combined with x-ray. All told, 88 cases were inoperable and 245 had surgery. All told, 794 x-ray treatments were given and 89 radium treatments were given.

Of all the cases treated, 74 are known to be dead, 69 cases are under treatment still, or known to have recurrences, while 24 are known to be symptomatically free from recurrences. This leaves 137 cases unaccounted for. To these 137 cases letters of inquiry were sent and 82 replies

were received. Forty-five were symptomatically well while 9 had recurrences and 28 were dead.

Of the larger groups of cases, replies were as follows: breast, 21; 5 were dead, 1 was recurrent, and 15 were symptomatically well. Cervix, 24 replies; 9 were dead, while 1 had a recurrence, and the remaining 14 were free from symptoms. One of those had had such extensive involvement primarily that the Percy cautery was used previous to a later hysterectomy. This case has now been well more than three years. Uterus, 4 replies; 1 was dead and 3 were free from symptoms. Of the 6 replies received from the ovarian cases, 4 were dead, 1 had recurrence, while 1 had been well for more than three years. These particular 55 replies were in response to the letters sent out to 60 cases in this particular group, which left only 5 cases in this group unaccounted for.

Of the six replies of the lip cases that were well, two of them had had glands removed, while the remaining four had had glandular radiation.

Analyzing these 82 replies more carefully, we found that of the 45 that were all right, 27 of them had had surgery and x-ray combined, while 3 had had x-ray and radium combined and 2 others had x-ray, radium and surgery combined, leaving 13 which had surgery alone, or in other words 32 of the 45 cases, or 71 per cent of all those that were well had had the combined methods of treatment.

Of the 9 cases that were recurrent, 3 had had surgery alone and 3 had had x-ray alone, the remaining 3 having had x-ray and surgery combined. Here we find that in the recurrent cases, 66 per cent had only one method of treatment, and finally of the 28 that were dead, 11 had had surgery alone and 6 had x-ray alone, while the remaining 11 had surgery and x-ray combined. Of the dead, 60 per cent of them had had only one method of treatment, while only 40 per cent had had the combined methods, all of which demonstrates very clearly to my mind the great advantages offered by the combined methods in the treatment of deep seated malignancies.

Discussion follows paper of Drs. Kohlmann and Samuel, page 707.

RADIUM THERAPY IN FIBROID AND OTHER BENIGN CONDITIONS OF THE UTERUS*†

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and
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In any discussion of the subject of radium and the treatment with radium, it is absolutely necessary to take into consideration the fact that this method of treatment is practically in its infancy. Remarkable progress has, however, been made in a very short time, and in the last few years radiotherapy has come to be more and more recognized by the medical profession as an important factor in the treatment of those conditions whose relief has heretofore been wholly dependent upon surgical measures. Experience has shown that some of these conditions are far more easily controlled and cured by the ray than by the knife, and this method is to be preferred, not only on account of its desirability in the treatment of the specific disease, but also because the patient is able to react more readily when the mental strain of the surgical procedure is eliminated. In cases of bleeding, this is especially true because the patient is already greatly weakened by loss of blood.

Profuse menstruation, otherwise known as menorrhagia, and excessive, irregular bleeding from the uterus, called metrorrhagia, occur either in cases where no pathological changes of the mucous membrane or a small myoma are to be found, or at least, their presence suspected. These abnormal conditions are of greatest importance, not only to the gynecologist, but to the general practitioner as well. Long-lasting, and at times profuse bleedings from this source have weakened many a patient to such a degree that death seemed almost inevitable.

In the past, the treatment of these abnormal conditions has been far from satisfactory. Every known variety of internal treatment, such as tonics and glandu-

*From the Radium Institute of New Orleans.
†Read in the Section on Surgery, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

lar medication, i. e., ovarian and thyroid extracts, have been tried extensively. The use of horse serum was without success. Local treatment of the mucous membrane of the uterus with numberless drugs, cauterization and curettage have not given satisfactory results, and in spite of these measures, finally, in desperate cases, removal of an apparently healthy uterus had to be resorted to, in order to insure the safety of the patient.

In contrast to such an extensive and mutilating surgical cure, how simple and successful is the radiotherapy by Roentgen and radium rays!

In the beginning of 1914 we started the treatment of the conditions just described, by the apparatus suggested by Gauss, of Kroenigs' clinic in Freiburg. The results were very satisfactory, but the details of the treatment, as all of you well know, were rather trying and time-consuming to both patient and operator.

The advent of radium, which has been at our disposal in sufficient quantities since June, 1915, supplanted the roentgen ray, as its application is not only more simple, but also more effectual.

Three groups of cases have been subjected to treatment. In all these cases, however, careful examination had to be made in order to exclude those in which appeared the slightest degree of pelvic inflammation, and thus avoid any possible exacerbation of existing inflammatory symptoms. The three types mentioned above are:

(1) Cases of menorrhagia or metrorrhagia, in which local examination revealed no pathological condition.

(2) Cases presenting the symptoms of metritis, especially those at menopause.

(3) Cases in which the fundus of the uterus was thickened to such an extent as to justify the suspicion of the presence of small intramural fibroids, or where the fibroid had developed to such a size that the myomatous disease was clinically predominant.

The extent of the influence of the radium treatment on bleeding depends upon two factors:

(1) The age of the patient.

(2) The amount of element and time of application.

The extent of the disease of the uterus (clinical and microscopical) is scarcely to be considered, as extensive disturbances of this organ are just as easily influenced by radium as minor ones.

Women near the menopause require smaller doses. As a rule, the application of 50 mg. of radium for twelve hours is sufficient to stop bleeding and, in many cases, induce the menopause.

In younger women the larger doses are necessary, especially if anemia of higher degree demands the early cessation of menses. It is difficult to decide the strength of the rays necessary to diminish the bleeding in younger women without incurring the possibility of an early menopause. It should be our aim to prevent an abrupt cessation of menses, as younger women are generally as greatly disturbed by radium as by ovariotomy. Small doses by moderately prolonged intra-uterine application may have such an effect. Twelve hundred milligram hours seems to be the largest dose advisable in younger women, if menstruation is expected to continue, and the smallest dose in older patients near the menopause, if it is desired that the menses should cease entirely. The intra-uterine application of radium is to be preferred to the vaginal, for it is more effectual, and furthermore, frequent applications in the vagina and cervix could produce shrinking of the lumen, which is to be considered, especially in middle-aged patients, as the possibility of pregnancy is still present. This was the experience in one case of our series.

Mrs. H. O'N., age 37 years, menstruation at 15, regular but scant periods of 3 to 4 days duration. Married 8 years. Children 3, no miscarriages, labors easy, patient stating that labor never lasted longer than 3 or 4 hours. March, 1918, uterine bleeding began, which was scant but persistent. Early abortion was suspected and the patient curetted March 11, 1918. The scrapings did not confirm this suspicion, and were negative for malignancy. A section of tissue from the slightly eroded cervix was negative. No relief from the bleeding was obtained, and the patient was referred to the radium department of Touro Infirmary for treatment. The records of the department report three administrations of radium (vaginal). There was no bleeding for 5 months, until Feb. 1, 1919, when the patient reported a profuse menstrual period, followed by a scant flow in March with no further bleeding. Pregnancy was normal. Labor set in Dec. 12, 1919. Delivery was delayed, the bag had ruptured

early; the cord was prolapsed. Progress was very slow. Vaginal examination revealed hard, unyielding ring in location of internal os. As pains increased and labor did not progress, forceps were attempted, but extraction was impossible on account of the above-mentioned hard ring. Eventually an abdominal Caesarian delivered a well-formed child of 8 pounds. The patient died on the fifth day, manifesting symptoms of acute dilatation of the stomach.

In regard to efficiency and greater safety, radium could easily take the place of surgical interference in fibromyomata, but large tumors are not very suitable for radium treatment, especially those reaching to the umbilicus. Multiple subserous and very hard fibroids are not easily amenable to radium treatment. The best results are effected by radium in the intramural variety. In these cases the size alone cannot be considered a contra-indication, as these soft, rapidly growing tumore are especially influenced by radium.

The changes in a myomatous uterus are similar to the ones after normal change of life. The uterus gets gradually, but slowly, smaller. Small fibroids, especially if the blood supply is poorly developed, will shrink more quickly than larger vascular ones.

The fact that rapidly growing tumors may be considered fibromyomata, when really they are sarcoma, should not prevent the use of radium, as malignant degeneration is very rare. A rather unusual case came under my observation of a woman who was treated for hemorrhage due to fibroid of the size of a fetal head.

Mrs. J. S., Touro Infirmary, No. 71901. Age 42 years. Diagnosis, fibroid of uterus. For one year the patient had been menstruating frequently and profusely at times. She had had a small fibroid for many years. Examination showed uterus enlarged, the size of two fists, irregularly shaped.

Radium treatment: Feb. 2, 1918, 75 mg. intra-uterine for 8 hours; March 2, 1918, 50 mg. intra-uterine for 6 hours.

Result: Menses ceased and uterus diminished in size.

Two applications relieved the bleeding, brought about the artificial cessation of menses, and the uterus began to shrink, until at the end of the fourth month, the size of the uterus was diminished so that no positive diagnosis of fibroid could be made. After about one year hemorrhage suddenly occurred, and returned in about one month. Uterus had markedly enlarged again, and the possibility of a sarcomatous degeneration induced me to perform abdominal panhysterectomy. The uterus showed dense tissue parts, where apparently the previous fibroid had been found. However, one new nodule, the size of an orange, had formed, and microscopical examination proved it to be a malignant leiomyoma. Patient made a good recovery from the surgical operation, and is in perfect health today.

We have treated 42 cases of these benign conditions of the uterus, of which there were 2 of the first type of cases, namely, those of menorrhagia or metrorrhagia where no pathological condition could be found, and one of which was extremely serious and interesting in regard to the ultimate outcome.

Miss H. A., Touro Infirmary, No. 67338. Age 22 years. Average weight 86 lbs. Menses at 15 years, regular, but profuse for five days. January, 1918, had an attack of grippe, and when periods came menstruated for about six weeks. Lost a good deal of flesh after January. Appetite very poor; bowels fairly regular. Patient very thin and anemic. Curetted first week in May to check bleeding. May 16, began bleeding again. When first seen pulse above 130 and weak. She was taken to hospital. Uterus packed. Radium advised to check bleeding. Two treatments given:

1. May 24, 1918, 50 mg. intra-uterine for 7 hrs.
2. June 3, 1918, 50 mg. intra-uterine for 11 hrs.

Patient did not menstruate for one year, after which time, returned regularly and in normal quantities.

Of the second type (cases of metritis), there were only five, all of which were relieved by one or two treatments.

The majority of the cases were fibroids, of which variety there were thirty-six. All were treated with radium and, with the exception of two, were relieved from their subjective and objective symptoms. In these two cases panhysterectomy had to be done, one on account of increase of pain, which had been present to some extent before treatment, and the other was a case of large dimensions, the tumor reaching about two inches above the umbilicus.

Mrs. I. B. M., Touro Infirmary, No. 59829. (Increase of pain). Age, 44 years Diagnosis: fibroid. Patient suffered severe menstrual pain and increased flow. Had to remain in bed first two or three days. Slight vaginal discharge. Intra-uterine application of 50 mg. of radium in celluloid tube did not change character of menses. On the contrary, it produced continued pain. Hysterectomy was done, which was followed by relief of symptoms.

Miss A. B., Touro Infirmary, No. 60691. (Large tumor). Age, 30 years. Diagnosis, fibroid. Patient always enjoyed good health,menses regular until October, 1916. Menses became irregular, about every 15 days, flow profuse, of

CASES OF FIBROID

Name	Hospital Number	Age	No. of Applications	Amount of Element	Method of Application	Time of Exposure
Mrs. P. A.	79859	50	4	1.—50 mg.	Intra-uterine	10 hrs.
				25 mg.	Vaginally	10 hrs.
				2.—50 mg.	Intra-uterine	10 hrs.
				25 mg.	Vaginally	10 hrs.
				3.—50 mg.	Intra-uterine	10 hrs.
				25 mg.	Vaginally	10 hrs.
				4.—50 mg.	Intra-uterine	10 hrs.
				25 mg.	Vaginally	10 hrs.
Mrs. F. B.	70080	56	2	1.—50 mg.	Intra-uterine	9 hrs.
				2.—50 mg.	Intra-uterine	9 hrs.
Mrs. C. B.	80366	50	2	1.—50 mg.	Intra-uterine	18 hrs.
				2.—50 mg.	Intra-uterine	12 hrs.
Mrs. A. B.	80260	40	1	50 mg.	Intra-uterine	18 hrs.
Miss A. B.	60691	36	5	1.—50 mg.	Intra-uterine	4 hrs.
				2.—50 mg.	Intra-uterine	9 hrs.
				3.—50 mg.	Intra-uterine	9 hrs.
				4.—50 mg.	Intra-uterine	10 hrs.
				5.—50 mg.	Intra-uterine	11 hrs.
Mrs. J. B.	85399	38	1	75 mg.	Intra-uterine	12 hrs.
Mrs. de C.	67012	46	4	1.—75 mg.	Intra-uterine	10 hrs.
				2.—75 mg.	Intra-uterine	11 hrs.
				3.—100 mg.	Intra-uterine	11 hrs.
				4.—50 mg.	Intra-uterine	11 hrs.
Mrs. R. E.	63250	45	1	50 mg.	Intra-uterine	10 hrs.
Mrs. A. F.	57645	42	2	1.—50 mg.	Intra-uterine	12 hrs.
				2.—50 mg.	Intra-uterine	12 hrs.
Mrs. W. F.	81860	28	3	1.—50 mg.	Intra-uterine	12 hrs.
				2.—50 mg.	Intra-uterine	12 hrs.
				3.—50 mg.	Intra-uterine	12 hrs.
Mrs. M. F.	83207	44	1	100 mg.	Intra-uterine	12 hrs.
Mrs. L. F.	83144	46	2	1.—50 mg.	Intra-uterine	12 hrs.
				2.—50 mg.	Intra-uterine	12 hrs.
Mrs. I. F.	63390	49	2	1.—50 mg.	Intra-uterine	11 hrs.
				2.—50 mg.	Intra-uterine	10 hrs.
Mrs. M. G.	83231	46	1	50 mg.	Vaginally	24 hrs.
Mrs. P. G.	83854	42	2	1.—50 mg.	Intra-uterine	24 hrs.
				2.—50 mg.	Intra-uterine	12 hrs.
				25 mg.	Vaginally	12 hrs.
Mrs. M. H.	62431	40	3	1.—50 mg.	Intra-uterine	23 hrs.
				2.—75 mg.	Intra-uterine	10 hrs.
				3.—75 mg.	Intra-uterine	11 hrs.
Miss L. H.	71907	34	3	1.—75 mg.	Intra-uterine	8 hrs.
				2.—50 mg.	Intra-uterine	24 hrs.
				3.—50 mg.	Intra-uterine	10 hrs.
Mrs. C. H.	72821	44	2	1.—75 mg.	Intra-uterine	10 hrs.
				2.—75 mg.	Intra-uterine	11 hrs.
Mrs. G. K.	60399	42	3	1.—50 mg.	Intra-uterine	10 hrs.
				2.—50 mg.	Intra-uterine	21 hrs.
				3.—50 mg.	Intra-uterine	12 hrs.
Mrs. M. K.	68563	42	2	1.—50 mg.	Intra-uterine	10 hrs.
				2.—75 mg.	Intra-uterine	23 hrs.
Mrs. S. L.	85273	51	1	50 mg.	Intra-uterine	10 hrs.
Mrs. B. L.	70021	33	2	1.—50 mg.	Intra-uterine	10 hrs.
				2.—50 mg.	Intra-uterine	8 hrs.
Mrs. R. L.	66751	46	2	1.—50 mg.	Intra-uterine	8 hrs.
				2.—50 mg.	Intra-uterine	10 hrs.
				25 mg.	Vaginally	10 hrs.
Mrs. C. M.	63392	47	3	1.—50 mg.	Intra-uterine	10 hrs.
				2.—75 mg.	Intra-uterine	11 hrs.
				3.—50 mg.	Intra-uterine	10 hrs.
Mrs. J. M.	72902	42	2	1.—50 mg.	Intra-uterine	10 hrs.
				2.—50 mg.	Intra-uterine	10 hrs.
Mrs. I.B.M.	59829	44	1	50 mg.	Intra-uterine	10 hrs.
Mrs. M. M.	62313	39	3	1.—50 mg.	Intra-uterine	11 hrs.
				2.—50 mg.	Intra-uterine	11 hrs.
				3.—50 mg.	Intra-uterine	11 hrs.
Mrs. A. R.	81318	29	3	1.—50 mg.	Intra-uterine	12 hrs.
				2.—50 mg.	Intra-uterine	12 hrs.
				3.—50 mg.	Intra-uterine	12 hrs.
Mrs. M. S.	56963	35	2	1.—50 mg.	Intra-uterine	11 hrs.
				2.—50 mg.	Intra-uterine	10½ hrs.
Mrs. S.J.S.	85585	44	1	50 mg.	Intra-uterine	22 hrs.
Mrs. T. S.	63480	50	2	1.—50 mg.	Intra-uterine	11 hrs.
				2.—75 mg.	Intra-uterine	11 hrs.
Mrs. J. S.	71901	42	2	1.—75 mg.	Intra-uterine	8 hrs.
				2.—50 mg.	Intra-uterine	6 hrs.
Mrs. M. S.	78811	43	3	1.—75 mg.	Intra-uterine	10 hrs.
				2.—75 mg.	Intra-uterine	10 hrs.
				3.—75 mg.	Intra-uterine	10 hrs.
Mrs. L. T.	61200	35	2	1.—50 mg.	Intra-uterine	11 hrs.
				2.—50 mg.	Intra-uterine	11 hrs.
Mrs. A. W. (Dr. Hirsch).	81702	40	2	1.—50 mg.	Intra-uterine	24 hrs.
				2.—50 mg.	Intra-uterine	12 hrs.
Mrs. B. W. (Dr. Cohn).	82912	44	2	1.—50 mg.	Intra-uterine	24 hrs.
				2.—50 mg.	Intra-uterine	24 hrs.
Mrs. W. W.	80409	39	4	1.—50 mg.	Vaginally	10 hrs.
				2.—50 mg.	Vaginally	10 hrs.
				3.—50 mg.	Intra-uterine	10 hrs.
				4.—50 mg.	Intra-uterine	10 hrs.
Mrs. F.D.W.	85402	44	1	50 mg.	Intra-uterine	23 hrs.

five days duration. May 4, 1917, severe hemorrhage for one day, bleeding continued for ten days. Recurrence of hemorrhage May 29, large clots. General weakness. Vaginal and abdominal examination revealed large fibroid extending above navel.

Treatment:

May 21/17. 50 mg. radium intra-uterine for 4 hrs.
May 30/17. 50 mg. radium intra-uterine for 9 hrs.
June 9/17. 50 mg. radium intra-uterine for 9 hrs.

Patient began to improve, but after a few months flow increased again, and two more applications were made.

Feb. 6/18. 50 mg. radium intra-uterine for 10 hrs.
Feb. 13/18. 50 mg. radium intra-uterine for 11 hrs.

Patient did not show any improvement. On the contrary, continued to have a great deal of bleeding, complicated by continuous discharge. Hysterectomy was decided upon, and uterus was removed. The tumor was about the size of a boy's head: one large fibroid, with multiple small subserous fibroids.

All the other fibroid cases were relieved by one to three applications of 50 mg. radium of mostly twelve hours duration. I have here a detailed history of these cases, giving number and time of applications:

Summarizing the results of these observations, we see that an average of only a little more than two treatments was necessary to produce the desired results. The age of the patients was, with one exception, between 30 and 56 years, ten cases ranging from 30 to 40, and the rest from 40 to 56 years. The average number of treatments given to the cases between 30 and 40 was only slightly increased over the treatment of the cases above 40 years of age.

The method of preparation of the radium applicators that are being used at our clinic by Dr. Samuels and his associate, Dr. Bowie, has been to use the two mm. of silver. This is further enclosed in the celluloid containers with cotton packed on top, and melted paraffin poured on top of the cotton, thereby sealing the container. Then the celluloid capsule receives a paraffin coating, which probably takes care of most of the beta rays. The method of sterilization is to put the whole applicator down in 40% formalin, allowing this to remain, with part of the white thread that is attached to the tube, for about ten minutes. It is then taken out, and sterile water is poured over the applicator, after which it is put into sterile gauze until inserted. We are indebted to Dr. Robert Abbe for the idea of the celluloid capsule, which we have found very efficient. The element is packed in the very end of the applicator, and not allowed to come in contact with the cervix. When more than 75

mg. are used this is impossible, but this large amount is only used in desperate cases when two or three applications with the ordinary amount have failed. The usual cleanliness that is used in all vaginal work prevails here. We do not use the retention catheter, as the liability of cystitis is always present, no matter how careful we are. After the introduction of the applicator a large vaginal pack is applied well against the cervix to hold the tube in position. The pack must not make the patient uncomfortable enough to prevent voiding. We do not allow the patient to sit up after the radium is in position. At the termination of the application, the patient is instructed to take a douche night and morning of very hot saline. A watery discharge always follows and usually appears in about five days. This continues for about six months after the application, and gradually subsides. For each subsequent application the same rules apply.

DISCUSSION

Papers of Dr. Floyd and Drs. Kohlman and Samuel.

Dr. Louis Frank, Louisville, Ky.—My own tentency, and I believe it is true of all those who have used radium, is to become very enthusiastic about certain cases in which it is used. This is notably true in carcinoma of the uterus, and in cases of myopathic bleeding and small fibroid tumors. We may say, I think without fear of successful contradiction, that in myopathic bleedings the percentage of cures will approximate 100. However, we do not believe that radium and x-ray should be used except as an adjunct and aid to surgery. Therefore, we believe their use should be confined to the surgeons themselves, particularly, radium and therapeutic x-ray should never be used by a mere technician, but by a careful and skilled radiologist. The use of these agents is fraught with some danger. Our own experience has been largely with radium. The radiological work is done by a skilled radiologist. The first speaker called attention to some of the dangers we have to deal with in treatment of the pelvic organs of women. There must not be any inflammatory diseases in the pelvis. Such cases when radiated are accompanied by great danger of lighting up of the inflammatory disease. Therefore the radiologist must know what he has to deal with before he applies this kind of treatment.

One point I would touch upon so far as the paper of the essayist is concerned is the hopelessness of many of the carcinoma cases that are sent for treatment. We cannot hope to get results with many of them. But in a certain number of them, hopeless as they are, the lives are prolonged by radium therapy. The point of accurate diagnosis, as mentioned by the first speaker, before treatment, we think is very important. This was touched upon the other day by Dr. Bloodgood in relation to bone tumors.

We are getting very good reports from radium in tumors that have never been submitted to the microscope. We believe that all cases, even the myopathic bleeding curettings, should be submitted to the microscope and we believe this should be done in every case. Naturally, in some of the deep-seated growths treated by x-rays this cannot be followed out. We had this illustrated yesterday, for instance, in a case of carcinoma of the jaw in which large glands in the neck were dissected out and then treated with x-rays. The glands were broken down and suppurating. Had the case been treated by x-rays alone without microscopic diagnosis, we should have looked upon this case as a cure by x-ray, and the glands as malignant. For that reason the diagnosis should always be microscopic.

Another point that I think has not been sufficiently touched upon is the preoperative treatment of malignancy by x-ray and radium. In the first essayist's paper the point was particularly stressed that these cases were treated post-operatively by x-ray and some with radium. This is as it should be and we have made it a rule to treat all cases of malignancy following operation with x-rays, in some cases leaving the wound wide open for treatment. But the preoperative treatment is just as important. The operation must be performed rather soon after this treatment or the fibrosis will be so great as to give trouble.

We have treated about three hundred cases in the past four years with radium and from this group we have made a collection of our cases of cancer of the cervix which we would like to review briefly if we have the time.

During the past four years we have treated 74 cases of cancer of the female genital tract, divided as follows: cervix uteri, 61; vagina, 6, of which 5 were recurrences after operation for cancer of the cervix, which probably should be listed with the above. Of these 61 cases of cancer of the cervix 26 are alive; three of these cases were radiated after operation; 1 was treated (inoperable), and four months later was operated in another clinic. Three of these cases occurred in patients previously operated for fibroids. In five cases the lesion was distinctly local; all of these are alive and perfectly well. Four of them were treated more than a year and a half ago. Of the rest of the group, 27 are dead or dying. A number of these lived for twenty to thirty months without any local evidence of disease, death resulting either from deep extension or pressure on the ureters and uremia. In 8 cases the result is unknown. In the 6 cases of cancer of the vagina, the primary one died. When first seen the rectum was infiltrated and operation was impossible. Of the five recurrent cases four are dead or dying; 1, untraced.

We believe that all cases of cancer of the body of the uterus should be operated upon. This type of cancer metastasizes late and operation a year or more after the onset of symptoms often brings a cure. After operation all of these should be treated by radium in the vagina and should have crossfire through the abdomen with the Coolidge tube. The number of these cases treated by ra-

dium is seven. Four are alive and well, one more than three years and another more than two years. One is dead and two have not been traced.

Our results in treatment of cancer of the rectum have been most unsatisfactory. We have treated thirteen inoperable cases, and we are sorry to say that none of them is well. This may be due to the fact that there was very wide extension when the patients were first seen by us. Notwithstanding our unsatisfactory results we think that these cases should be given the benefit of treatment in the hope that we may prolong the life of the individual and sometimes obtain a cure. In operable cases we think that radium should be used before operation, thus killing off some of the cancer cells and making recurrences less probable.

Dr. H. E. Ashbury, Baltimore, Md.—There is in this question of the use of radiation an idea abroad that there is a difference between radium radiation and x-ray radiation. There is a difference, but it is a difference which is physical. The rays of both radium and x-rays fit into the light spectrum where the wave lengths are shortest and overlap each other, the gamma rays of radium being a little shorter and more penetrating than the x-rays which we are able to generate at the present time. These very penetrating rays give off a greater number of beta rays which we find are the active agent of destruction in the treatment of malignant disease. X-ray machines are now being constructed capable of operating at 200,000 volts that will undoubtedly produce energy equivalent to large quantities of radium.

Dr. Floyd has discounted the value of his slides a little, for I think they show admirably the pathology which was present. They reveal the necessity for surgeons knowing in advance of operation the extent of metastases. Breast cases should have the chest roentgenographed before the breast is removed, and in prostatic carcinoma an x-ray study should be made of the spine and pelvis for evidence of metastases. The method now advocated for the treatment of malignancy is the combined use of radium, x-rays, surgery and electro-thermic coagulation. By their timely and intelligent application the surgeon has a formidable weapon with which to control the treatment of malignancy. It has taken years to educate the public to go to the surgeon when they have a suspicious lesion simulating cancer. I am afraid if the radiologist attempts to control the treatment of the disease without the aid of the surgeon that we shall undo that part of the education that it has taken so long to establish.

The preoperative and postoperative treatment by x-radiation is supposed to seal lymphatics and prevent the development of metastases. In the case of preoperative treatments, one should wait until the full effect of the radiation has had time to make itself evident before operating, and one should not operate while the reaction is at its height, since the tissues do not heal quite so readily. Postoperative x-ray treatments should be started as soon as practicable, and cases should be kept under systematic observation to detect recurrences early.

That certain types of malignancy respond better than others, is well known. In my experience, some patients with carcinnma of the cervix and evident metastases in the pelvis after radical operation and intensive x-ray radiation, have made a good recovery, while others having similar lesion, and just as complete surgery and radiation, continue to advance in spite of all the treatment we can give them.

Dr. Richard A. Barr, Nashville, Tenn.—The distinction between the use of surgery followed by x-ray and radium, and the use of radium and x-ray followed by surgery should be definitely made. I am only interested in two types of cancer, cancer of the breast and cancer of the uterus. Unless the preoperative radiation does definitely seal the lymphatics it certainly is of no advantage, and we lose some time in using it. Even if it does this, I cannot see the use of sealing the lymphatics before operation unless you expect to handle the tissues very roughly and squeeze the cancel cells out. I cannot see the use or advantage of preoperative radiation in cancer of the breast. It should of course always be used after operation. In inoperable cancer of the cervix I think everybody now advises the use of radium. In this class of cases I have had only a limited experience, and that recently, with the use of radium. For a number of years I have had all cases of cancer of the uterus that I have operated on given postoperative x-ray treatment and with good results. Cases of cancer of the cervix that were at all advanced I formerly referred to someone who had radium. I began to be suspicious of myself and thought perhaps I was putting the dividing line toward surgery because I had surgery and did not have radium. It is very natural for a man to feel, if he has only one plan of treatment to offer, that everything is suitable to that, so I decided I had better supply myself with radium and so be able to make a less prejudiced selection of cases. The advantage in the use of radium in cervical cancer over some other cancers is that it can be placed directly in the center of the disease. If it has any influence whatever of course it is right where it will have the widest area of influence. The effect of radium as you get away from it diminishes with the square of the distance. It takes four times as much radiation to get the same effect at 2 cm. that you do at 1 cm. Now with regard to operation after the use of radium in cancer of the cervix, if you are going to get any effect from the radium you get it in that tissue that you can remove by hysterectomy. Consequently, in doing hysterectomy you will remove the tissue that has had most effect from the radium and leave that which has had the least effect. For this reason it seems to me that if you are going to use radium in cancer of the cervix you should use the maximum dose, and in addition use the x-ray in front and behind for its effect on the areas not reached by the radium, and having done this you should be satisfied and should not operate. I have not had sufficiently long experience myself to draw conclusions from it, but I am leaning more and more to the use of radium in all cancers of the cervix, even very early cancer. I have been following the technic of Dr. Schmitz of Chicago, in cervical cancer, using 50 mgs. of radium for ten hours a day, for seven or eight days. This, he thinks, will give you the maximum effect of radium that you can obtain without burning the

rectum or bladder. I wish to say, as a practical point, that I have taken my courage in my hands and have used 50 mgs. in the cervix for as much as ten hours a day for fourteen days without any serious burning of the rectum or bladder, but I have done this only in those cases with an enormous cancer of the cervix in which I was confident that the cervix itself would act as a very considerable filter and so protect the rectum and bladder.

Dr. M. F. Bledsoe, Port Arthur, Texas.—There is a tendency, as we all know, to follow where results seem easy to get in cases where they have been hard to get formerly. I only wish to speak of one point in Dr. Kohlman and Dr. Samuel's paper, and to note that in his statistics I believe one case was under 30 years of age where they used radium for profuse and prolonged bleeding. The younger the woman the more radium it takes to bring about a premature menopause, which indicates the effect of the radium on the uterine wall. Unless we become too prone to quit seeking the cause of this bleeding of young women, it is well to pause at this period in a paper of this kind. I wish the Doctor in closing would mention just a bit along the line of what their experience is in that line. It seems to me that with an agent with which it is so easy to control these conditions it might get too easy and we might use it too much.

Dr. F. Webb Griffith, Asheville, N. C.—I should like to ask whether the Doctor has used radium at all in cases of persistent leucorrhea, as Dr. Curtis of Chicago has reported.

Dr. William D. Haggard, Nashville, Tenn.—I feel that these agents which are so very efficient should be used with great caution and skill. Carcinoma is essentially a surgical malady and if anybody in the world has had the experience that is most valuable it is the surgeon, and it seems to me the surgeon should by experience and judgment know best when to use radium. The surgeon, with all of these various agents at his command can come nearer choosing the agent that is best indicated than the man who has only surgery, or only x-rays or only radium. In other words, our feeling has been that if we could apply these agents, in the proper manner as an adjuvant to surgery we should be doing the greatest good. Radiotherapy is in its infancy and it is a problem to know just what to do, and what not to do. The men who have used radium for some time have felt that if it would do such marvelous things in the inoperable cases of carcinoma of the cervix, it could be used successfully in the early cases. Personally, I have not been able to bring myself to do that. We still do hysterectomy in the early cases and use radiation as an adjunct. When we look back and see the few cases of carcinoma of the cervix that are alive and well after five years our courage oozes out at the ends of our fingers. I saw a woman recently whom I operated seventeen years ago for carcinoma of the cervix. You can count them one by one. By their infrequency ye shall know them. Some men have been emboldened to use radium in the early cases rather than surgery and are very enthusiastic about it. Personally, I feel that we should stay close to shore for a while. We have recently had two cases of recurrence of carcinoma of the cervix operated elsewhere, within the year, one in February and one in July, and radium has been able to dissipate the recurrences, so if radium will do that we feel that we should first operate and then use it as a prophylactic.

Radium should be supplemented wtih x-rays for larger areas. The work of Dr. Floyd has enabled us to investigate our own cases and gives us a little firmer ground to stand on, and when we found that twice as many cases that had had surgery plus radium and x-rays were alive and free from recurrence as those who had surgery alone, it encouraged us to go on with the combined treatment. I hardly know how we should get along without it. The carcinomata of the cervix have been the despair of surgery, the cases that are inoperable, but they yield splendidly to radium and x-rays. We have had a goodly number of cases that are clinically well, not necessarily permanently well. It is not easy for me to delude myself about cancer. Nobody has a more wholesome fear of its treachery. I had a case that was operated upon by my father for cancer of the breast twenty-seven years before, who had a recurrence and after five years had spontaneous pathologic fracture of the femur, that was evidently metastatic, while turning over in bed. It would seem that thorough-going post-operative radiation would have effected a permanent cure in a case so favorable that remained free from recurrence from a simple amputation without axillary dissection, for so long a period. By the utilization of these agents if we can add anything to the time limit and comfort of these patients and at the same time get a complete and permanent cure we will feel that our efforts are not in vain.

Dr. Floyd (closing).—I did not wish to make the impression, or have anyone think for a moment that we are claiming to cure malignant conditions, but from the reports we have received in tracing up quite a large number of these cases we know we have temporarily greatly benefited a number of them. Of the final outcome, of course, we do not know. I believe in many of these inoperable and many of the advanced cases the relief that we can give by radiation, particularly in the advanced cases that are suffering great pain, is remarkable. It is not infrequent to have these patients come in under the influence of morphin for the pain they are having, and after one or two treatments have them give up the morphin and go on to the metastatic end without much pain.

Bleeding can be checked and the odor can be checked, and the patient can live much more comfortably whether life is prolonger or not. We do not believe at present that either of these agents can take the place of surgery, but if it is true that we can destroy malignant cells at a distance of one and a half inches from the location of the growth, it seems that we are coming to the point of curing these early cases by radium without any surgery at all.

A number of the points very ably discussed by Dr. Frank were covered in the paper but were omitted on account of the length of the paper.

As to preoperative radiation, we have not done so much of this as has been done by other men. We have been radiating some of our cases before operation, but we do not wish to make any claim or report at present.

Speaking of the prostate cases, I remember that we have had two cases brought in that we have apparently greatly benefited by radiation. In one the mass was so extensive that we could not remove the entire gland, only a portion of it, by operation. Following enormous doses of rays over a period of fifteen to eighteen months the patient remained well and apparently free from trouble for two and a half years. Another case is symptomatically well at the end of more than a year. They both were inoperable cases primarily.

In conclusion, I wish to stress one point that I was not able to bring out in the paper but which was mentioned in the discussion, and that is, the routine raying of every breast case that comes with the lump in the breast or axilla. If you have not been doing this you may be surprised at the number that will show lung metastases. This is particularly true of sarcoma in general. You will be surprised to x-ray the lungs and find a sarcomatous metastasis in what you have thought was an operable case. We have in two or three cases shown liver metastases, the masses being shown throughout the liver which, on the plate, resemble, but are not so definite as the shadow masses in the lungs. Those cases were refused operation and went on and died shortly of what we thought was metastases which had already taken place in the liver.

Dr. Samuel (closing).—I am purely and simply a radiologist. I am not a surgeon or gynecologist; I do not see one of those cases until they are referred for radium treatment. The only thing I am asked to pass on is the amount of radium that should be used, the amount of time and how often it should be repeated. I cannot understand why in every medical meeting I attend I hear the statement that we should not use the radium, that it belongs to the surgeon. Dr. Ashbury made the statement that x-rays and radium intertwined with surgery. I see no reason why we should not use radium as we use x-rays. I have been using radium under the direction of the best men in the city, the cases being diagnosed clinically and from the microscopic end as well, and then referred to the radiologist for treatment.

Regarding Dr. Bledsoe's remarks, radium should be used by the specialist and not by the general physician. The average general surgeon knows as much about it as the nurse in a sanitarium, as to how much and how long and how far from the skin it should be used and how treated. When you get radium they get you to go to their laboratory and teach you how to use it in two or three weeks.

We have not treated any case under twenty-eight. A case under twenty-five does not belong to the radiologist, or radium therapeutist.

We have had some excellent results in using some 25 mgs. sutured into the cervix and usually one such treatment suffices.

I think all are in accord in regard to the treatment of fibroids. In the service of Dr. Matas, whose work I have the pleasure and honor of doing, operative interference in fibroids of the uterus has been cut down 75 per cent. He is perfectly satisfied with what we are doing.

In closing I wish to say that I think Dr. Barr is a very brave man to leave the radium in so long.

EXTENSION TREATMENT OF FRACTURES*

By Thomas H. Ingram, M.D.,
Memphis, Tenn.

In 1916, the importance of the treatment of fractures of long bones by means of traction and extension produced a great awakening in the minds of bone surgeons. Since the advancement of this treatment there have been so many additions and changes that it has seemed wise not only to describe again the methods, but also to give the broader principals of application and a somewhat detailed description of their use to obtain the best results. It is not the object of this paper entirely to describe in detail the various parts of the apparatus or the method by which each fracture according to its site, is treated.

The chief purpose of treatment of any fracture is to restore function. For this reason, the essentials are, correction of the deformity, fixation of the fragments until security is assured supplemented by protection and careful watching during the period of bone reconstruction.

The chief advantages of the method are based upon the improvement of the circulation of the member as evidenced by the rapid diminution in the swelling, the greater ease of examination daily, the greater ease of dressing, if compound, the greater ease with which the fragments can be controlled and the great comfort to the patient, all speak in its favor.

It is a known fact under this treatment union takes place more rapidly, large callus formation is prevented, that spreading infection necessitating amputation takes place less often, and that the motion either above or below the fracture is more free than by the use of any method of treatment involving absolute closed fixation.

In the simple fractures seen in civil practice the mechanism of the fracture and the lines of force are fairly constant and the resulting displacement therefore also relatively constant. In compound fractures with or without comminution, the relative position of the fragments are inconstant and it is invariably necessary

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to place the limb in such a position as to maintain it there or change it if necessary, so the lower fragment is brought in alignment with the upper. It may be safely said that every displaced fracture can be restored to a correct position only by extension and traction.

In as much as the chief elements in producing displacement are the active and tonic contraction of the muscles pulling the two halves of the bone apart, the chief element in the treatment must be to overcome this contraction by extension in the long axis of the limb. Extension then must be the cardinal act of fracture treatment, whether we called it by this name or another or whether we use it alone or supplement it by subsidiary measures.

The problem is chiefly a mechanical one and must be considered from a mechanical standpoint. It is the application of a definite force, acting in a definite direction, with the view of overcoming a definite resistance and bringing about a definite result. I use this reiteration advisedly because so many are content to deceive themselves by some sort of an extension which is left to magic and the good Lord and not to the known mechanical laws of physics.

If you will go down the aisles of any hospital it is common to see a 5-pound weight tied to the end of a man's leg, which is moreover bandaged to a long splint that has sunk into the bed clothes.

One might as well tie the man's pocketknife to the bottom of the bed and fix the lucky horseshoe at the head as to expect a small weight to do any good. The extension force must be properly fixed to the limb at the proper angle to overcome the angulation of the fragments, and to exert an efficient pull upon the distal fragment. The direction of the line of the pull is a most vital point, to correct the angulation due to the pull of the muscles.

To try to believe that a straight pull on all fractures regardless of angulation is correct shows ignorance in treatment, because the contraction of any one group of muscles is not in a straight line, as many cause angulation according to their attachment to the upper or lower fragment. Traction and extension, if properly applied and supervised may be efficient in the treatment of all long bones because the tension on the ensheathing muscles aids in the alignment of the fragments and security is soon assured by formation of the external callus.

THE AMOUNT OF THE EXTENSION FORCE

It must be adequate to fully correct both angulation and overlapping, you cannot give your man a dose of medicine and trust to therapeutics, but use one force to overcome another and the force you use must be of such an amount as to do what you require of it. If you do not think your pull is sufficient, test it with the x-ray.

Do not depend altogether upon measurements of the muscular limb as they are difficult to carry out with precision, and even then may give you false indications of reduction and deformity.

In the early stage of one week after the injury the following table will represent the usual amount of extension force necessary to correct displacement:

For a femur	20 to 25 pounds
For a tibia	12 to 14 pounds
For a fibula	12 pounds
For a radius or ulna	8 to 10 pounds
For a humerus	8 to 10 pounds

This chart has served me splendidly as a rough guide, but the amounts used in each case must be determined by results.

Enormous force for leg extension is not advisable as it causes the patient considerable pain, pulls your plaster off, and, worst of all, causes an injurious strain upon the ligaments of the joint below the fracture.

Conditions which make a large force necessary are:

1. Large bones.
2. Powerful muscles.
3. Pain causing muscular spasm—constant moving causing pain.
4. Extended position of limb which makes flexor muscles taut.
5. Long period since injury.
6. Resistance of bed upon which the limb lies or of splints to which it is bandaged.
7. Indirect or distant attachment of force.

Conditions which make a small force suffice are:

1. Small bones.
2. Absence of pain under influence of anesthetic, narcotic or certain kinds of light massage.
3. Immobility, which implies absence of pain and spasm.
4. Semi-flexed position of the joints by which the strong flexor groups of muscles are relaxed.
5. Commencement of treatment soon after injury before inflammatory exudation or healing tissues are present.
6. Freedom of the limb from restricting bed, bandages or splints. (This condition is usually obtained by free suspension of the limb in a sling.)
7. Direct attachment of the extending force to the distal fragment.

Some of these conditions are beyond our control, but the majority are within it.

The best time to apply extension force is while the patient is still under the anesthetic and placed in such a position that movement will not be necessary for days or weeks.

DIRECTION OF THE EXTENSION FORCE

If the extending force be of proper amount, properly applied, and the limb is in correct position, it is usually unnecessary to employ any lateral or rotatory forces which greatly complicate treatment and mar the simplicity of the method.

In certain parts, owing to the greater power of the muscles on one side of the limb than those of the other, there is always a tendency to angulation, and this can easily be counteracted by suitably adjusting the direction of the extension.

THE NATURE OF THE EXTENDING FORCE, THE IMPORTANCE OF CONTINUOUS EXTENSION

In the old method of setting a fracture the limb was pulled away from the trunk, then fixed to a splint. Today we know this is quite ineffectual by the evidence of the x-rays, but probably the failure is due more to gradual re-displacement than to inadequacy of the original setting.

The chief factor which causes and maintains displacement is the constant muscle-pull which gets stronger when the shock of the injury has passed away. Now, a constant or mobile force can only be met and overcome by another constant mobile counter-force of greater power. It is not enough to pull the limb out to a correct length and tie it to a splint by a fixed strap or bandage. Either the bandage slips or the strap becomes stretched, or the patient moves the limb in such a way as to slacken the extension. The extension force must be of the nature of a constant pull either by a weight acting over pulley, or by a spring of steel or elastic.

THE BEST FORCE

The best force in my experience has been the spring or elastic force, rather than by a weight acting over a pulley, because of the fact that the patient cannot get away from the spring pull as he can the pulley and weight. The spring pull needs no adjustment, the weight and pulley are continuously getting off the track and out of adjustment.

The adaptation of the rules of practice to defective mechanics, the point of view from which the treatment is considered, and the results estimated may be illustrated by quotations from representative authorities on fracture treatment.

THE CARDINAL POINTS OF FRACTURE TREATMENT

1. The first step is to get accurate anatomical information as to the position of the fragments by x-rays.
2. If no displacement exists, then massage with passive movements is the procedure to be adopted.
3. If displacement is evident, then adequate extension is to be applied and further skiagrams taken after a few days.
4. If gross displacement still persists, the question of a more effectual extension method, by single or double transfixation, must be considered. If applied, its results must again be tested by sight and not by faith.
5. If extension methods suitable to the case still leave displacement either of (a) length, (b) rotation, or (c) axile angulation, the case demands open operation.
6. The more trouble a surgeon takes to master the technic of extension methods, the fewer cases of recent fractures will remain for open operation.
7. A case of fracture in which anatomical accuracy of reposition can be attained by non-operative methods will be restored

to functional activity more quickly by these than by operation.

8. Any operative fixation which requires the limb to be splinted continuously for a long period afterwards is not worthy of carrying out.

DISCUSSION

Dr. E. L. Scott, Birmingham, Ala.—I do not feel that there are many fractures of the thigh in which extension is indicated. The plaster cast, after proper reduction under the fluoroscope, settles the matter for us, and any one who has tried to put up a bad fracture in extension with fluoroscope and have extension continued perfectly, will get into trouble. When you reduce your fracture with the fluoroscope and can properly apply and get the right traction you get muscle pull upon the joint. I think one of the most important things to which Dr. Ingram has called attention is the application of the spring with reference to fracture cases.

Dr. Fred G. Hodgson, Atlanta Ga.—There is a word of warning about the extension treatment of fractures. I have noticed that there are a great many cases of ununited fractures of the humerus, and in some of these cases under consideration weight has been attached to them for a long time. That is a mistake. The ends of the bones are separated and union does not take place.

We had a report this morning of a large number of ununited fractures of the humerus operated upon. If you take a fracture of the humerus and there is overlapping of the fragments, you can put extension on for two or three days and the ends of the bone will come together, but after that extension is unnecessary. If the fracture is put up in some form of fixed bandage healing will take place much more readily than if extension is continued.

FACTORS THAT LOWER THE MORTALITY RATE OF SUPRAPUBIC PROSTATECTOMY*

By Geo. R. Livermore, M.D., F.A.C.S.,
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Regardless of every precaution we may take, every test we may rely upon and every care we may exercise, a certain percentage of patients submitted to a suprapubic prostatectomy, will die. The responsibility devolves upon us of making this percentage as low as possible. That the mortality rate of suprapubic prostatectomy has been higher than that of perineal, is a well known fact. This is due, in my opinion, to the fact that it is easier to perform and therefore is used by a greater number of surgeons, especially by the inexperienced. Their medical college training has imbued them with the safety of operating through the space of Retzius, while the intricacies of the anatomy of the perineum make them hesitate to attempt to remove the prostate from below. The factors that have a bearing in reducing the mortality of suprapubic prostatectomy are manifold, but there are two that are preeminent and these are: (1) The two step operation and (2) the control of hemorrhage.

THE TWO STEP OPERATION

The two stage operation has done more to reduce the mortality of prostatectomy than all other measures combined and although it has some disadvantages, it should be used in every case. Its life-saving qualities are great enough to outweigh every other consideration.

The disadvantages of the two step operation are the mental effect of the two operations upon the patient; the disagreeable and troublesome suprapubic drainage tube, with its attendant discomfort and leakage; and last and by far the most serious, the formation of cicatricial tissue in the wound, which increases the danger of injury to the peritoneum and makes the abdominal wall so rigid that adequate retraction and good vision are impossible. The former is not so dangerous as one might think; for if iodin is applied, the torn peritoneum sutured, gauze packing placed over the sutured area and the head of the bed elevated, no harm will result. The latter on the other hand is a very objectionable feature. The control of hemorrhage, which is the most important part of prostatectomy, is interfered with, because the surgeon cannot see the bleeding vessels and it is difficult to ligate them or put in sutures when the opening in the bladder cannot be retracted and the field of operation is far away. This can be partly obviated by cutting out as much of the scar tissue as possible on either side of the incision.

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Regardless of these disadvantages, the two step operation should be performed in every case because:

1. The bladder will be cleaner than when drained through a retention catheter, thus diminishing the possibility of sepsis.

2. The kidneys are better prepared to stand the removal of the prostate. The back pressure is entirely relieved and is prevented from recurring, as the drainage is continuous.

3. The bladder is at rest and has become accustomed to the suprapubic tube.

4. The congestion of the prostate has been relieved, thus diminishing the hemorrhage and making its control easier.

5. Through the suprapubic wound there is a certain amount of absorption of toxins and by the antibodies thus produced, the patient is rendered less susceptible to infection.

In this connection another factor that plays an important role in the reduction of mortality is the gradual withdrawal of urine from the bladder, which prevents congestion of the kidneys and consequent uremia from sudden relief of back pressure. We always precede the suprapubic cystotomy or first step of the operation by placing a retention catheter in the bladder. The urine is drawn off and the bladder filled with boric acid or 1:500 protargol solution. The solution put into the bladder should be a few ounces less than the amount of urine drawn off. Each time the bladder is drained, the solution is put into the bladder and the amount gradually diminished each day until the bladder is finally allowed to remain empty.

While this procedure is being carried out, should the patient show signs of failing kidney function such as hiccough, drowsiness, nausea and vomiting, diminution in urinary output, etc., the amount of retained solution is immediately increased and measures instituted at once to stimulate the kidney function. When the bladder can be left empty and the patient's condition is satisfactory, the first step operation is performed.

By putting the bladder at rest the congestion and inflammation of the prostate and bladder are relieved. It is remarkable to note the reduction in size of a hypertrophied prostate after the first step operation. The free and constant drainage and thorough irrigation of the bladder rapidly clears the urine and we soon note a decided improvement in the patient's condition.

CONTROL OF HEMORRHAGE

Regardless of all argument against the two step operation, no one can gainsay the fact that the possibility of severe hemorrhage is greatly lessened by it. Some of these patients improve temporarily and then despite our best efforts, gradually decline and finally go out like a spark. These are not as a rule included in the mortality rate of most surgeons.

Death following the first step operation only, does not bring prostatectomy so much in disrepute, for the patient has been made more comfortable and his family and friends know it was undertaken in the hope of getting him into condition to undergo the operation. Though this failed, his few remaining days on earth were made more peaceful.

As I have already stated, I consider the control of hemorrhage the most important part of the operation of suprapubic prostatectomy. As these patients are all old men and at best poor surgical risks, every ounce of blood they lose diminishes their chances of recovery. We are jeopardizing the lives of our patients when we remove a prostate and take no measures to control the hemorrhage. It is true that some prostates will shell out easily with so little hemorrhage, a hot saline irrigation will check it satisfactorily. There are others that shell out just as easily and yet the bleeding is severe and difficult to control, and even after ligation of the chief bleeding points and suture of the capsule, tight packing and pressure are necessary to check the hemorrhage. All of us, too, have seen cases where the loss of blood, during the operation, was so slight that adequate measures for the control of hemorrhage were not resorted to, and yet these same patients continued to lose blood after reaching their rooms, and packing and pressure were then necessary before it was checked.

It is my rule never to let a patient leave the operating table until I am satisfied that the hemorrhage is under control. After removal of the prostate, the bladder is ir-

rigated with hot saline, the prostatic cavity freed of clots and kneaded between the fingers in it and the finger in the rectum, the Mayo-Judd retractor is inserted and an attempt is made to clamp and ligate the principal bleeding points. If the hemorrhage still continues, sutures are inserted and if these fail, a gauze plug, to which is tied a heavy silk ligature, is pushed into the prostatic cavity and the ligature brought out through the urethra and traction made upon it. This may be supplemented by more gauze packing and if the bleeding still continues, pressure may be made upon the packing by strapping a sponge holder, pressed firmly against the packing, with strips of adhesive plaster attached to the abdominal wall. Transfusion may be resorted to, for this not only assists in checking the hemorrhage but supplies blood in place of that which has been lost. Testing the coagulability of the blood prior to the operation and the administration of horse serum, when it is poor, will aid in preventing troublesome hemorrhage. I have discontinued the use of the Hagner or Pilcher bag because it is very painful and should the tube by which it is withdrawn break off, which frequently occurs, it is necessary to subject the patient to another anesthetic before it can be removed. After the patient leaves the table, bladder irrigations should not be used until all danger of hemorrhage is past.

It is important to use a ¾-inch drainage tube, for it is less likely to become plugged by a blood clot and by allowing free drainage, it prevents bladder contractions, thus diminishing the possibility of hemorrhage Shock plays an important role in the mortality of this operation and we should resort to every means in our power to get our patients in the best possible condition to resist it.

PRE-OPERATIVE TREATMENT

As you know, the heart, kidneys and blood must be gone over carefully and the blood pressure studied. We must satisfy ourselves about the creatinin, nitrogen and urea content of the blood. The phenolsulphonephthalein output must be known. I consider it a safer guide to inject the phthalein intramuscularly rather than intravenously. The total amount of urine passed in 24 hours should be measured and its urea content determined. The digestion should be looked after, elimination increased and intestinal antiseptics administered and alkalization of the tissues attempted by giving alkalies by mouth and glucose solution with soda bicarbonate per rectum.

Before the patient comes to the operating room he is given chloretone by mouth and 5% glucose solution by rectum. He is wrapped up warmly and before the anesthetic is started, the field of operation is prepared, towels and sheets adjusted and everything gotten in readiness to begin the instant the patient is anesthetized. The operation is done as quickly as possible and all hemorrhage checked before the patient leaves the table, the drainage tube sutured in place and dressings applied. The patient is again wrapped up warmly, for it is in transferring these old men from operating room to bed that much of the chilling and subsequent shock and pneumonia can be traced. The bed should be warm and the patient covered and tucked in snugly. I like to administer 500 c. c. of saline intravenously before the patient leaves the operating room, regardless of his condition, for it can certainly do no harm and in the majority of cases will do a great deal of good by preventing shock and aiding the kidney function.

POST-OPERATIVE TREATMENT

Eight ounces of a 5% glucose solution are given by Murphy drip every six hours. Caffein sodio benzoate grs. 1 by hypodermic every six hours, if the pulse is weak or the kidney function failing; or nitroglycerine gr. 1/100 when the blood pressure is high and the pulse tense. Six or eight hours after the operation, it is wise to repeat the intravenous saline, for it has been my experience that the more water these patients get, the more satisfactory will be their progress.

Uremia carries off more patients submitted to a prostatectomy than all other causes combined, because when other complications develop, such as hemorrhage, sepsis, pneumonia, etc., there is always an increased load put upon the kidneys and when they fail the end is near.

Uremia can be prevented by careful pre- and post-operative examination and

treatment. The patient should be thoroughly examined as previously outlined and all measures instituted to promote elimination, stimulate kidney function and prevent chilling.

Septicemia.—It has always seemed paradoxical to me that infection does not always occur after doing a suprapubic prostatectomy, because the operative field is constantly bathed in pus and the patients are poor surgical risks. That infection does not occur oftener is due no doubt to the resistance built up by the gradual absorption of the toxins from the infection in the bladder. It is best prevented by thorough preparation and it is here that the two step operation adds so much to the patient's chance of recovery, both by improving his general condition and increasing his opsonic index. The administration of urotropin and acid sodium phosphate aids in rendering the urine less infectious and the giving of mixed vaccines, beginning about ten days prior to the second step operation still further aids in making antibodies, thus helping the patient to combat the infection.

Should septicemia occur, we resort to large quantities of water by mouth, by rectum, by skin and by veins. Here alkalization of the tissues is essential. Therefore, glucose and soda per rectum and glucose intravenously will render valuable assistance. Phylacogens undoubtedly help in some cases and when given intravenously beginning with one minim and gradually increasing the dose every day, much good may be accomplished. If the pulse is of good volume and blood pressure not too low, I advocate blood-letting and transfusion by the citrate method. This may seem drastic, but we are dealing with an almost hopeless condition and desperate conditions demand desperate remedies. Some years ago I gave my experience with Hume's method of administering nitrate of silver intravenously, in the treatment of septicemia, and stated that I no longer feared it because this treatment was almost specific. I still use it and have seen striking examples of its worth, but as I have also seen two cases in which it failed, I wish to make the fact known.

Bronchitis and pneumonia.—These are best prevented by keeping the patient warm in operating room, in the halls and when back in bed. Use as little anesthetic as possible. Gas-oxygen is best. Change the position of the patient often and get him up early. No definite time limit can be fixed, but it is safe to say that patients kept in bed too long do not progress so well as those gotten up early. Atheromatous arteries certainly predispose to hypostatic congestion and if the patient is allowed to remain on his back for long intervals, pneumonia is almost certain to develop, especially if the dressings are allowed to become saturated, thus wetting the night clothes and sheets and chilling the patient.

The choice of the anesthetic is also important. For the first step I use a local anesthetic, usually 1% novocain. The patient is given 15 grains of chloretone 1½ hours and 10 grains 45 minutes before the operation, or hyoscine gr. 1/150 and morphin gr. ¼ is given one hour before. For the second step, chloretone only is given as above and gas oxygen is used. If the control of hemorrhage prolongs it beyond the point of safe gas anesthesia, ether may be added, but I always endeavor to complete the operation under gas-oxygen alone.

SUMMARY

In closing, the points I desire to emphasize are:

1. The two step operation for every case;
2. Adequate control of hemorrhage; and
3. Phrophylaxis, rather than treatment, of complications.

DISCUSSION

Dr. Courtney W. Shropshire, Birmingham, Ala.—To my mind there are three stages in suprapubic prostatectomy: ante-operative, operative, and post-operative.

The ante-operative is not given the attention that it should be. As the essayist has outlined very thoroughly, the care and treatment of the patient before is as essential as the operative and post-operative treatment.

With the operative stage, there are two great factors to be considered: hemorrhage and shock. The hemorrhage I have successfully controlled by the use of the Hagner and Pilcher bags and have never had the misfortune to have them break, as the essayist states that he has on several occasions. Perhaps the reason for this is that I keep on hand new bags, for we know rubber goods will deteriorate with time. I find the bag preferable to all other methods of controlling hemorrhage, for by proper adjustment you can place the mucous membrane that originally surrounded the prostate into the bed where the prostate originally

was and pulling the bag down into place control the hemorrhage and prevent a raw bleeding surface from being exposed to the urine. I have never used chloretone, but I use gas and oxygen, infiltrating the capsule of the prostate gland with novocain and adrenalin, as first advocated by Lower, of Cleveland. This seems to facilitate the removal of the prostate gland if one is careful to get the solution injected properly, and it also controls the hemorrhage. The adrenalin controls the hemorrhage temporarily; then the Hanger and Pilcher bag holds down the flaps and with pressure applied controls the secondary hemorrhage which sometimes occurs. I have had only two cases where hemorrhages were alarming and in both these the prostates were carcinomatous.

Fluids should be pushed, as the essayist has outlined. The sodium solution by rectum and saline intravenously have proven very valuable in my hands.

I have recently been checking my functional test with the method of estimating the total solids in the 24-hour urine. If they run below 45, the phthalein is also low in output.

The two-stage operation has its advocates. I have found that in cases where we have not a severe infection of the bladder an indwelling catheter with irrigations of mercurochrome will clear up these badly infected bladders. The catheter will drain the majority of these cases unless there is a very marked pericystitis; then it is advisable to do a suprapubic cystotomy, making the incision into the bladder as high as possible. and draining the bladder; when the patient has sufficiently recovered to warrant the operation. You may then proceed with the second stage. Should one find difficulty in keeping the catheter in and have trouble with drainage in this respect, I have found that the trocar and canular as first used by Lower, of Cleveland, and later by Ballenger, are effective.

This trocar and canular, as you know, are used by inserting into the distended bladder, withdrawing the trocar, and threading the catheter through the canular, then withdrawing the canular and allowing the catheter to remain in the bladder, to give drainage.

One of the greatest factors in the recovery of patients following suprapubic prostatectomy is getting them out of bed as soon as possible, into a rolling chair and out in the fresh air, thereby preventing pneumonia, which we find is a serious complication with old men.

Dr. H. W. Walther, New Orleans, La.—Among the factors reducing the mortality in prostatectomy we should stress more forcibly the method of removal under local anesthesia. Naturally, in working with local anesthesia we must select our cases. We cannot employ local in all cases, no matter how well the local anesthetic itself may be used, but with our very old cases with atheromatous arteries and reduced renal function for whom we must do something, we should attempt to master the technic of removal of the prostate by local anesthesia. For a number of years I have been associated in any number of cases of prostatectomy removed by this method by Allen, of New Orleans, who was one of the first in this country to bring forward this method, and by the method described by Allen one can very often remove the prostate with very little, if any, trouble to the patient. The infiltration is by no means easy and we find very few hospitals that have needles to do this work properly. One needs very long needles. We use them four or five inches long in order to get around the capsule and in the urethra properly. We find that the rectal portion of the prostate is the most difficult to anesthetize. We do believe somewhat in the anociation of Crile, and if we can do two-thirds of the operation by local we can finish up with a slight amount of general. These prostates in old men do not all come out so easily as text books would lead us to believe, and the shock should be borne in mind. If we can do the operation two-thirds or four-fifths with local, even if we do not carry it through, we should try this method. We should take our time and if the surgeon cannot give the necessary time to some of these patients, they should be sent to someone who can.

Dr. A. J. Crowell, Charlotte, N. C.—We have a very forcible illustration of the importance of the pre- and post-operative care in these prostatic cases in the report recently made by Dr. Buerger, of New York. He showed that in twenty-six hospitals in New York City and in other cities around New York the fatalities following nephrectomies were about 23 or 24%, and following prostatectomies were slightly over 22%. This work was done by the general surgeon, but he, as the Doctor just said, does not go into these cases himself so carefully as the urologist. We know that they neither have the time nor equipment to do the work and detail it to others. Since the reorganization of these hospitals, holding the urologist responsible for these cases, the fatalities have been reduced to about 2%.

I have had very little experience with suprapubic prostatectomies but much with the perineal operation as well as the pre- and post-operative care of these prostatic cases. Our success in this work is due largely to the care Dr. Thompson has taken of them before and after operation. Good results can be obtained by both the perineal and the suprapubic operation. The advocates of each claim the better results. How are we to decide in an unbiased way which is the better? By comparing results obtained by the same operator and corps of assistants. I have made up my mind to go home and take the cases as they come and do the suprapubic and perineal operations alternately with the pre- and post-operative care and the operation done by the same men and compare our results. If we can get better results by the surprapubic route we will do suprapubic instead of perineal prostatectomies. But few men do first one and then the other. Each is convinced that the plan he follows is ideal and follows it almost regardless of conditions. I do not see why we cannot take care of and prepare these cases for operation by means of the urethral catheter. We are never called upon to do a suprapubic puncture in order to drain the bladder. We drain all of them and do it through the retention catheter or by intermittent catheterization. In this way the pressure can be relieved by gradual reduction as was suggested by the essayist. In the suprapubic drainage you have the sudden relief of the pressure to which the kidneys have been unaccus-

tomed and sometimes anuria is produced by the congestion following sudden and continuous relief. If the patient dies before the prostate is removed, the fatality is not charged up against the prostatectomy because the prostate was not removed. I wonder how many fatalities occur in these cases before the gland is removed? I believe that Judd's plan of removing the gland is probably the better. He does the complete operation, sutures the capsule and drains with the catheter as well as suprapubically, or at least drains some of his cases both ways.

Dr. Carl Wheeler, Lexington, Ky.—I am a three-stage prostatectomist. The first stage I shall call the preliminary catheter drainage. I prefer to infect my patient with the catheter, giving him his proverbial colon infection, thereby vaccinating him and raising his resistance.

After about two weeks drainage you will notice there has been a marked change in your patient. The thrist has subsided; the dry tongue has vanished; the ache in the renal angles gone; the appetite is improved; and the bladder is cleared of its infection. The kidney function has been raised. You have done much toward raising your surgical risk.

Patients with greatly distended bladders over a long period should be cautiously catheterized and the back pressure upon the kidneys should be released very gradually, by intermittent catheterization for several days before the catheter is permanently anchored.

The second stage I shall call the suprapubic cystostomy, and introducing the large dePezzer drainage tube. The most important thing in this operation, as I consider, is the two deep through and through silk-worm gut sutures at the upper and lower angles of the bladder wound. These two sutures lift up the bladder, close off the upper and lower spaces and prevent infection. Formerly I used to be very particular about small wick drains especially in the lower angle of the abdominal wound.

The third stage I shall designate as the enucleation of the prostate.

The interval between the cystostomy and the enucleation is sixteen to twenty-one days, and even longer if the risk of my patient is at stake.

We can usually forecast the kidney sufficiency and shock, but the immediate bugbear following the enucleation is hemorrhage, and for this I always use the Hagner bag anchored to a Wheeler-Hamer cage to hold it in place.*

Some men contend that the bag gives our patients discomfort. Be that as it may, my mind is far more tranquil for the first twelve hours. There is no argument whatsoever against the two or three stage prostatectomy, as it is the only way that we can take many of the most unfavorable risks through a successful operation.

It may take a little longer time, but we cannot consider that when the life of the patient is at stake.

I wish to ask three questions:

How many men have had ventral hernias following their suprapubic work?

How many have had incontinence following suprapubic enucleations?

How persistent was it and how long did it last?

*Trans. Am. Urol. Assn., 1917.

Dr. John R. Caulk, St. Louis, Mo.—I believe most of us prepare our patients for operation in about the same way and have absolute faith that the preliminary treatment is the most important factor in the operation. I was glad to hear Dr. Livermore lay stress on catheter drainage as preliminary drainage. I think the first stage operation is done chiefly to wall off the prevesical space and fascias to prevent infiltration, and if we have prepared our patient with catheter drainage, we do not have to wait so long between stages and can protect against sclerosis around the bladder and peritoneum. If we go in within ten days we very rarely injure the peritoneum. In this neighborhood the peritoneum will stand a good deal.

As urologists we have an ideal method in seven out of ten times of doing either a perineal or suprapubic prostatectomy on a bad risk, a man who has uremia, or sepsis, or a severe cardio-vascular lesion. That is sacral anesthesia. I have used it on bad cases for several years, and recently on good cases, and in seven out of ten times 30 to 60 cc. of novocain in the sacral or perisacral region, will give complete anesthesia to the neck of the bladder. We have had complete anesthesia at the time of removal and it is an excellent thing for bad risks.

With reference to hemorrhage, after the second stage, I agree with Dr. Livermore that the engorgement has gone down so markedly that the hemorrhage is lessened in the two-stage operation. While we always anticipate hemorrhage, we have had no trouble with it. I always use the Hagner bag and have had no bad results. I have broken them off but have never had the slightest trouble in getting the bag out.

It is not necessary to put the drainage tube in at the second stage. You have a perfectly clean tract and can plaster it over with stearate of zinc or zinc oxid and the wound will heal better than with a drainage tube, which only invites pressure necrosis and tends to prolong healing.

Dr. E. G. Ballenger, Atlanta, Ga.—Speaking of the ventral hernia reminds me of a change in our technic of closing wounds, and that is, we put two or three times as many through-and-through sutures as we formerly did. This prevents the cutting of the silkworm sutures and you have a much better looking wound if there are plenty of stitches, through-and-through.

My reason for doing and advocating the two stage prostatectomy is that the shock of the second operation is very much lessened because of the preliminary incision. While many times the amount of shock in one stage operation is insignificant, undoubtedly there is less of it if the operation is done by the two stage method. If there was no other reason than this lessening of shock, it would be sufficient reason for the two stage operation.

Dr. Lewis Wine Bremerman, Chicago, Ill.—I would like to ask one question if it may be permitted me. We know we have a very good drainage through our tubes, and the patient is kept more or less comfortable by drainage, but a very great bugbear comes after I take the tube out, three to five days after its removal. I should like to know if Dr. Livermore or any of the others have any mechanical directions by which they can prevent the frequent wetting of the patient and his chair and bedclothes, and the continued discomfort

these patients are in for several days following the removal of the tube. That, to us, is the greatest bugbear of the whole proceeding. We can change them frequently during the day, but they frequently go all night without change. If there is any little trick for preventing this I should like to know of it.

Dr. Livermore (*closing*).—The Pilcher bag which Dr. Shropshire and Dr. Caulk use as a controller of hemorrhage is preeminent. The only objection is the pain caused by the rather large catheter which remains in the urethra. Many cases are so painful that the administration of morphin is essential. The breaking of the tube by which the bag is removed does occur, not only with the old bags but also with new ones. I never used a bag twice. When it breaks it is a difficult matter to remove the bag. Dr. Caulk said it was very easy. If the patient is not nervous and will stand for the pain you can go down with a long forceps and pick up the bag, but many men will not stand that procedure and go into a nervous collapse at the mention of passing forceps into the bladder.

The two step operation certainly does lessen the hemorrhage. You will be very greatly surprised at the condition of the prostate at the second stage, showing that the drainage has greatly relieved the congestion that was present. Another thing the two step operation does is to wall off the space of Retzius, thus diminishing the chance of infection when the prostate is removed.

I think the few cases of peritonitis that follow injury to the peritoneum are due to the fact that these patients are more or less prepared to stand a certain amount of infection and the peritoneum in this locality seems to be particularly resistant to infection.

I have never used local anesthesia on the second step for the simple reason that I would rather have the patient asleep and not knowing what is taking place than to have him awake and nervous. I have seen many local anesthesias, but have never seen one in which the patient did not complain of a good deal of pain. The cases are complicated by the fact that the patients are awake and seem to have some pain.

The catheter drainage we always use before the first step, but it is unsatisfactory in that the patient complains of the pain and very often the relaxation of the sphincter beside the catheter allows leakage. Sometimes we get symptoms of uremia from the fact that the drainage is rather excessive and more than should be drained off at any given time, so I prefer to do the drainage from above.

The incontinence and hernia was brought out by Dr. Wheeler. I have had hernia following the operation. I think in the old men whose muscular walls are more or less attenuated there is no doubt that we do have hernia at times, but I have never seen many of them. In regard to the incontinuence of urine, I have seen only one man who did not get over it, and as a rule it does not last long. In the one man there was a great mass of cicatricial tissue about the internal meatus from a previous operation.

I have never used sacral anesthesia, but think the same objection would hold good there, in that the patient knows what you are doing.

THE COMBINED EXAMINATION OF THE URINARY TRACT BY THE UROLOGIST AND THE ROENTGENOLOGIST*†

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The more recent advances in urology and roentgenology are responsible to a large extent for the greater accuracy in the diagnosis of urological conditions. The urologist has definitely established such procedures as uretero-pyelography and cystography, and they are now looked upon as routine methods. The roentgenologist realizes the limitations of the x-ray in diagnosis without the use of these methods. Recognizing these facts, we have made it a routine practice to combine the methods of both in the study of all urological conditions.

We shall demonstrate examples of pathology from the study of the last 250 cases that came to the urological clinic of the Hebrew Hospital in the past two years in which a combined study was possible and we shall outline our method of procedure and basis of interpretation, which we feel saves time and the annoyance of repeated cystoscopies, and enables a prompt and accurate visualization of existing pathology. Our deductions will offer a fair example of the limitations of the two methods individually and a practical idea of the value of the combined study in so far as the reduction of the percentage of failures is concerned and the large percentage of proven correct diagnoses.

While combined studies of the urinary tract are the rule in large clinics, there is room for the more general adoption of this method. The usual reasons for incomplete examination are these: (1) lack of facilities in the urologist's operating room for x-rays; (2) lack of facilities in the roentgenologist's laboratory for cystoscopy; (3) inconvenience of moving patients from one department to another;

*From the Urological and Roentgenological Clinics, Hebrew Hospital, Baltimore, Md.

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(4) inconvenience caused by the roentgenologist in not being on hand when the urologist is ready (where a technician is not employed; (5) reluctance on the part of many to advise or undergo elaborate or time-consuming examinations which are not understood.

The first three difficulties can be overcome by locating the departments together, or, if this is impractical, by using a bedside unit or portable x-ray machine with double screens and films, so that roentgenograms can be made on the cystoscopic table. Quite satisfactory results can be obtained by comparatively short

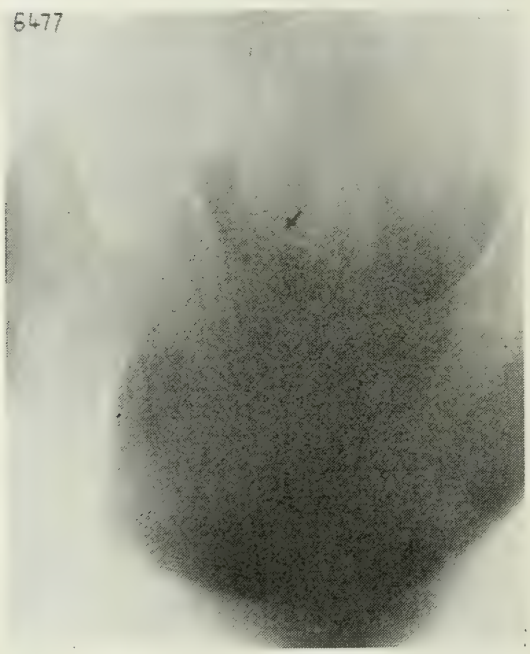

Fig. 1 (Case No. 6477).—Ureteral calculus, diagnosed by combined method. Plain x-ray showed shadow in ureteral region.

exposures. The fourth reason can be overcome by sympathetic cooperation, care of detail and team-work which is so essential for the satisfactory completion of any operation. The last reason will eventually correct itself just as the general adoption of the x-ray has depended upon the education of the people. The roentgenologist can help in this respect by suggesting further urological studies when in his opinion they are indicated.

Our method of procedure has been as follows: when a patient, in whose history, urological symptoms or signs are present, reports for examination, plain radiograms of both kidneys, ureters and bladder are made. No special effort is made to cleanse the intestinal tract, for it was observed that in most instances an accumulation of gas followed, rendering the radiograms unfit for conclusive interpretation. As soon as satisfactory radiograms are secured, the patient is examined from a urological standpoint, including ureteropyelography and cystography. This is carried out by the following method of examination: (1) cystoscopy and ureteral catherization of both sides; (2) relative

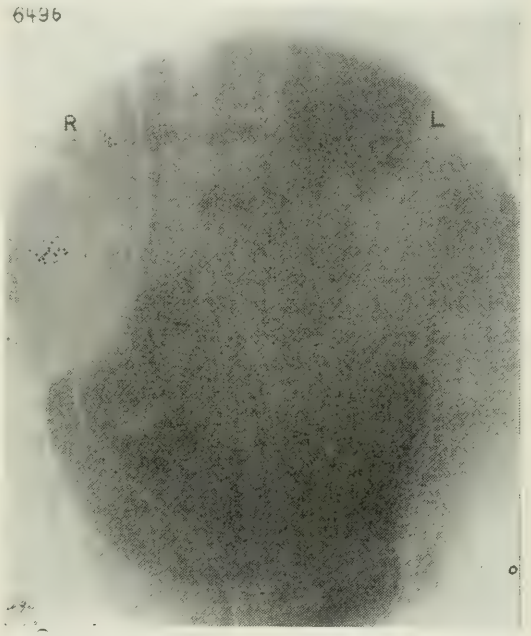

Fig. 2 (Case No. 6496).—Fecolith diagnosed by combined method. Plain x-ray showed suspicious shadows.

renal functional tests; (3) passage of a wax-bulb for determining the presence of ureteral calculi or stricture; (4) determination of pelvic capacity by injecting sterile water or normal salt solution to point of fullness; (5) ureterography, pyelography and cystography (radigraphic catheters No. 6 F), thorium solution (Burn's) 15%, or sodium iodid, 13.5%, and air injections have been used in this work.

METHODS OF VISUALIZING THE LUMEN OF THE URINARY TRACT

Capacity in all cases was first determined with sterile water or salt solution, followed later by injection of air through

a soft rubber catheter for the cystographic work and the administration of an opaque solution in the uretero-pyelographic work. It is understood that the administration into the renal pelvis of opaque solutions should be performed by competent urologists, who may use either the syringe or the gravity method.

Both methods have been used, but we prefer the syringe. We believe, that after carefully estimating the pelvic capacity, if one injects 2 to 3 c. c. less than the capacity, very slowly, the syringe method is quite as free from danger as is the gravity method, no bad results having been observed. There is danger, however, in repeating injections, and for this reason

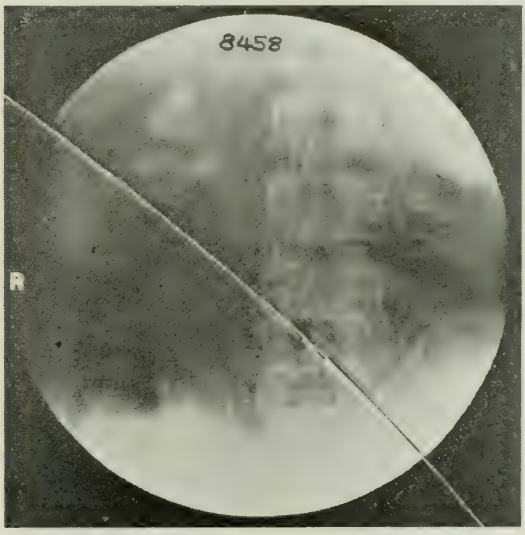

Fig. 3 (Case No. 8458).—Renal calculus diagnosed by combined method with pyelography. Plain x-ray showed shadow. Verified by combined method.

both the roentgenologist and the urologist should be extremely careful that there is no fault in their technic which may spoil the pyelogram. Overzealousness to secure a good plate by repeated injections should be guarded against. Pyelography under anesthesia is necessary at times. This may be controlled by fluoroscopy in guiding the catheter and in controlling the quantity of solution injected. It is, however, a dangerous procedure and should not be done unnecessarily. Occasionally, it may be essential to make a double pyelogram for comparison, but as a rule it is better to do each side separately.

INTERPRETATION

One should have a good mental impression of the normal kidney pelvis and be familiar with the more common abnormalities. Braasch has admirably covered the subject in his book on "Pyelography." The normal pelvis varies as much in size, shape and position as other organs of the body. So long as it functions normally, one should be careful not to confuse abnormalities of position with pathology.

The true pelvis, the major calices and the minor calices bear a rather constant relation to each other. Changes in one at the expense of the other is the rule in pathological conditions, as is seen in beginning hydronephrosis where the major

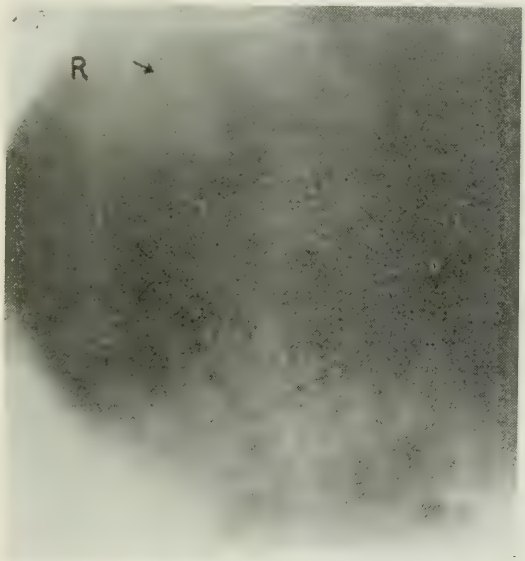

Fig. 4 (Case No. 7027).—Renal calculus. Plain x-ray showed small suspicious shadow. Combined method with pyelography verified the diagnosis of renal calculus.

calices become broadened and elongated and the pelvis dilated and the minor calices become flattened and the irregularities effaced. In over-distension, a relative enlargement of all three is present. Likewise, in incomplete injections and small pelves, the pelvis and minor calices are likely to be very small but bear a constant relationship. In movable and ptosed kidneys, where the ureters are circuitous, as long as there is no evidence of dilatation that would suggest obstruction, the condition may not be pathological. Differentiation between inflam-

matory and obstructive lesions are difficult, but, as Braasch has pointed out, the condition of the minor calices show greater dilatation and there is a clubbing effect to the major calices in inflammatory processes. Evidence of necrosis and destruction cause an irregular contour.

The presence of stones, calcareous deposits and pus from that side complete the picture of a pyonephrosis. Tumors of the kidneys are usually characterized by a deformed pelvis, elongated calices and an enlarged kidney outline which may displace the stomach and colon toward the median line. They may be readily differentiated from spleen and gall-bladder by stereoscopic pyelography.

Fig. 5 (Case No. 8647).—Hydronephrosis. Plain x-ray was negative. Combined method with pyelography, a diagnosis of hydronephrosis was made.

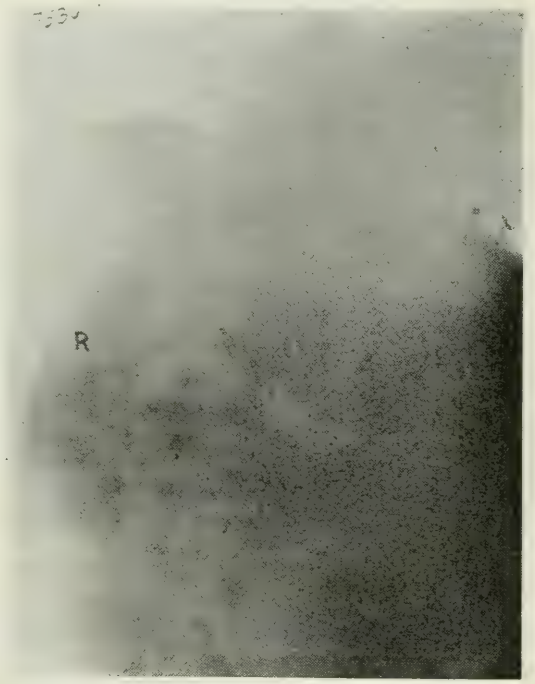

Fig. 6 (Case No. 7530).—Renal neoplasm. Plain x-ray showed large mass in renal region. Combined examination with pyelography made and diagnosed as renal neoplasm. Verified.

INTERPRETATION OF PLAIN X-RAY

Urological cases divide themselves into those giving positive x-ray finding and those giving no radiable evidence of disease on the plain x-ray plate. The principal conditions which give positive findings are:

(1) Urinary calculi, deposits of mineral salts in various parts of the urinary tract and inflammatory calcification. These conditions require differentiation from things outside the urinary tract, such as gall-stones, calcified glands, phleboliths, fecaliths, etc. These can sometimes be interpreted on stereoscopic plates by their characteristic shadows but usually require differentiation by ureteral catherization, cystoscopy or uretero-pyelography.

(2) Abnormalities in size, shape and position of kidneys such as renal neoplasm, enlarged kidneys, renal ptosis and perinephritic abscesses.

One should be cautious in making a positive diagnosis of a particular type of pathology from the shadow of a supposed enlarged kidney. We recall a case upon which operation was performed by another surgeon for a tuberculous kidney, which had been diagnosed on the plain x-ray plate. Upon operation, it was observed that no kidney was present. This would not have happened had the combined method been followed.

The conditions in which no radiable evidence of disease are seen far exceed the above groups, as our conclusions will show. Of the cases, 32.7% gave demon-

strable evidence of pathology on the plain x-ray and of these only 15% were conclusively diagnosed. Included in the non-radiable group one must consider the types of urinary calculi which are not diagnosed on the plain x-ray plate. These comprise those made up principally of uric acid, the largest percentage being found in the bladder. In general, statistics vary from 15% in the kidney region, 35% in the ureteral region and 61% in the bladder of non-radiable calculi. In view of the above, the roentgenologist should suggest further urinary study where the x-ray studies are negative if symptoms are referable to the urinary tract.

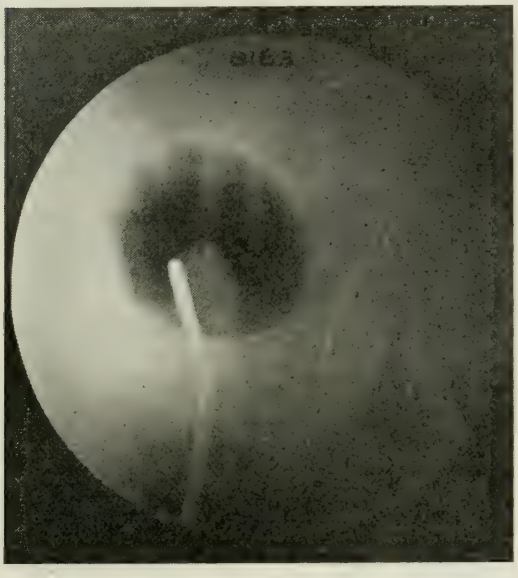

Fig. 7 (Case No. 8163).—Prostatic hypertrophy. Plain x-ray was negative. By a combined method with cystography a diagnosis of prostatic hypertrophy was made.

STATISTICAL STUDY

In the statistical study of the 250 cases upon which the conclusions of this paper are based, we have grouped the various conditions diagnosed as follows:

(1)	Normal pelves, ureters and bladder, 98	39.2
(2)	Congenital deformities (bifid pelves, 2	.8
(3)	Pyonephrosis (tbc 11)	4.4
	(non-tbc 6)	2.4
(4)	Combined hydronephrosis and pyonephrosis, 1	.4
(5)	Renal calculi, 15	6
(6)	Renal neoplasm, 4	1.6
(7)	Polycystic kidney, 1	.4
(8)	Renal ptosis, 5	2
(9)	Ureteral calculi, 19	7.6
(10)	Ureteral kinks, 8	3.2
(11)	Ureteral stricture (with hydronephrosis, 35)	14
	(with contracted pelvis, 5)	2
(12)	Ureteral diverticuli, 1	.4
(13)	Vesical neoplasm, 9	3.6
(14)	Vesical calculi, 12	4.8
(15)	Vesical diverticuli, 1	.4
(16)	Prostate enlargement (benign, 12)	4.8
	(malignant, 2)	.8
(17)	Perinephritic abscess, 3	1.2
	Total cases examined: 250	100%

In order to arrive at conclusions in reference to the limitations of the various methods employed, the following classes are given, based upon the 250 cases studied: 152, or 60.8%, demonstrated pathological lesions in the urinary tract, and 98, or 39.2%, demonstrated no urological lesion.

Methods of examination of the 152 cases are:

(1) Plain radiographic findings from plain plates of entire urinary tract:
- (1) Positive,* 15 cases, or 9.6%
- (2) Doubtful,* 35 cases, or 23.1%
- (3) Negative,* 102 cases, or 67.3%

(2) Urological findings by cystoscopy, ureteral catheterization, renal functional tests and wax bulbs:
- (1) Positive, 104 cases, or 68.6%
- (2) Doubtful, 44 cases, or 27.0%
- (3) Negative, 4 cases, or 4.4%

(3) Combined findings by cystography and uretero-pyelography:
- (1) Positive, 148 cases, or 97.4%
- (2) Doubtful, 4 cases, or 2.6%
- (3) Negative

Normal cases were not included in the above figures.

It will be noted from the division of the 152 cases that the plain x-ray gave evidence of disease in 50, or 32.7%, of which 15 were positive and 35 cases gave suspicious shadows or were doubtful and required examination by the combined method, leaving 102 cases in which no evidence of disease was demonstrated on the plain x-ray plate. Of the 200 negative diagnoses made by the plain x-ray, 98 cases were actually normal in every respect, showing a percentage of 42.32% of the entire series in which the negative x-ray findings were substantiated.

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*Positive: Conclusive diagnosis was made.
Doubtful: Findings were reported giving probable diagnosis, but in which verification was requested.
Negative: No abnormality noted by the method used.

The cases giving x-ray findings classed as positive and doubtful consisted of the following:

(a) Renal calculi, 15		
(b) Ureteral calculi, 19	41	
(c) Vesical calculi, 7		
(d) Renal neoplasm		2
(e) Enlarged prostate		2
(f) Nephroptosis		1
(g) Pyonephrosis		1
(h) Hydronephrosis		1
(i) Perinephritic abscess		2
		50

Out of a total of 46 urinary calculi, 41, or 89.1%, gave evidence on the plain x-ray plate; 15 were positive diagnoses and 26 demonstrated a suspicious shadow which was finally diagnosed by cystoscopy, uretero-pyelography and the scratch on the wax-bulb. Five cases, in which no evidence of a shadow was seen on the plain x-ray plate, were vesical calculi and were diagnosed by cystoscopy and cystography. Frequently, calculi in the bladder that are not seen on the plain x-ray plate may be shown in a cystogram. It is interesting to note that all the ureteral calculi that were diagnosed gave a definite shadow in the plain x-ray plate, which is contrary to the published statistics. In this connection, it is only fair to state that the passage of the wax-bulb for determining ureteral calculi was only done in cases which gave x-ray evidence of stone. It is possible that some of the 98 normal cases, as diagnosed by the combined method, may have had non-radiable calculi, but, if so, no evidence was obtained by ureteropyelography. The wax-bulb as a routine procedure has been used only during the past year, during which time no non-radiable ureteral calculi have been found.

One hundred forty-eight cases, or 97.3%, gave evidence of disease by the urological method. One hundred four, or 61.7%, were positive from the urological findings, and 44, or 38.3%, were doubtful. Four cases were undiagnosed. The 44 doubtful cases were finally diagnosed by the combined method, leaving only the four cases as undiagnosed.

The entire 152 cases which presented pathology were verified by an operation of some character. The 4 undiagnosed cases had such severe renal and ureteral colic that exploratory operations were deemed advisable. Pathological findings were demonstrated at the operation in all the cases including the four doubtful cases. The four undiagnosed cases consisted of:

(1) Polycystic kidney in which a normal pyelogram was not obtained.

(2) Bifid pelvis with marked perirenal and ureteral adhesions.

(3) Hematuria which at operation showed two aberrant vessels, but no other pathology.

(4) Ureteral adhesions.

CONCLUSIONS

(1) By the combined method of examination, our results show only 1.6% of failures.

(2) Urological lesions were demonstrated frequently by aid of the x-ray where they were doubtful in the two examinations individually.

(3) In over 50% of the cases in which the plain x-ray was negative pathological conditions were found by the combined method of examination.

(4) The plain x-ray findings should in all cases be verified by the urologist before a conclusive diagnosis is given.

(5) The combined method is the ideal procedure in the diagnosis of urological conditions.

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DISCUSSION

Dr. A. L. Gray, Richmond, Va.—Dr. Ashbury has failed to mention several points that I think are of very great assistance in these examinations. First, he has referred to uretero-pyelography only and not to uretero-pyeloscopy. I do not know whether Dr. Ashbury uses pyeloscopy at all, but I find that the roentgenoscopic view is sometimes a great deal more valuable than the roentgenographic view. If a stone has been excluded by previous roentgenographic examination, I resort to roentgenoscopy. If the stone has not been excluded, then I combine roentgenography and roentgenoscopy. The method of procedure is this: a leaded catheter is first introduced into the pelvis of the kidney. Plain plates

are made, that is, plates made before injection of any substance. I want to say also that it is my invariable rule to give the patient a purgative so as to exclude what Dr. Goldstein referred to as fecaliths. After having introduced the leaded catheter, which should be as large as possible to block the vesical orifice of the ureter and prevent regurgitation of the opaque material, I make plates that take in the entire urinary tract. Unless you have so minute a calculus that it cannot be detected on surgical intervention, you will see it in your plates, provided it is an opaque stone. I use the opaque solution, whether it be thorium, sodium bromid, sodium iodid, or what not. After having withdrawn the catheter until it merely blocks the vesical orifice, I withdraw it under fluoroscopic examination, and then inject the solution. This gives the information as to the capacity and size of the pelvis first hand, because you can check by observing the opaque solution going into the pelvis and when you have it full you stop.

I want to take issue with Dr. Ashbury in regard to the relative merits of the syringe method and the gravity method. When injecting with the syringe, at the time you make the plate you do not know whether the pelvis of the kidney is full or not and in a large percentage of cases your solution will have regurgitated into the bladder and you will get a useless plate. On the other hand, when you use the gravity method you will get the pelvis full nine times out of ten if the solution is allowed to run in while the plate is made. I want especially to emphasize, first, the great desirability of employing pyeloscopy, and second, the decided advantage of the gravity method over the syringe method.

I have not mentioned my reasons for withdrawing the catheter. If you use a stiff catheter, and a leaded catheter is very apt to be stiff, you are apt to straighten the ureter and not show a kink, even though it may be present, whereas when you withdraw the catheter and merely use the solution, you are very much more apt to show ureteral kinks than with the catheter present.

One other thing in favor of roentgenoscopy: a stone that is large enough in the average individual to demand a surgical procedure is very apt to be visible. If you have your leaded ureteral catheter in position, you may by rotating the patient or even by some of the methods of localization, determine whether that shadow, which is apparently a calculus, is behind or in front or whether it is in actual contact with your leaded catheter. Within the past week I have had two cases in which this method has been of inestimable value.

Dr. T. A. Groover, Washington, D. C.—A very valuable method of examination of the urinary tract, in certain selected cases, has not yet been mentioned. I think that roentgenoscopy of the kidney and ureter in conjuction with the injection of an opaque medium is of very great value as has already been indicated, but when this is combined with pneumo-peritoneum, information can sometimes be obtained which can not be gotten otherwise. We feel that this affords one of the most fertile fields of usefulness for the pneumo-peritoneum method, but of course we do not consider it applicable as a routine procedure. Our experience indicates that the combination of the methods is not particularly difficult, and is at least reasonably safe.

Dr. R. H. Lafferty, Charlotte, N. C.—I want to say a word about the kinks that you may sometimes find. If you withdraw your catheter and place the patient upright after the pelvis is filled with opaque solution, you will get the shadow of the kink. These patients have pain when upright that is relieved by lying down. I think some of you will remember the work reported by a doctor from Denver, whose name escapes me, along this line. He had worked out a number of these cases. There are many cases in which you have a kink with dilatation of the ureter above, which only becomes evident at pyelography when the patient is upright.

Dr. J. F. Armentrout, Roanoke, Va.—In a number of instances in which I have had occasion to do pyelography in connection with urology work, I have had a room especially set apart for that work so that if any other work comes in while the urologist is busy, we can take care of it without disturbing the pyelography work. A few years ago attacks of renal colic following the injection of sodium bromid, sodium iodid, or iodid of silver and organic silver solutions were very common. It is perfectly reasonable to expect when you fill the renal pelvis with any fluid, take the radiograph and remove the catheter and send the patient home or to his bed, that invariably he has an attack of renal colic, has to have an opiate administered and sometimes it is 24 to 48 hours before he has recovered from the attack. More recently we have been using the gravity method of filling the pelvis of the kidney, allowing it to flow in until the patient feels fullness and slight discomfort, then making the plates quickly, attaching to the catheter a half-ounce syringe, slowly aspirating fluid medium from the renal pelvis, before the catheter is withdrawn. Pus may be drawn from the kidney in the same way. I have not seen a case of renal colic following removal of the solution in this manner.

Dr. Ashbury (closing).—The presentation of this paper was for the purpose of reporting our results in 250 cases that were studied by the combined method with the hope of getting suggestions for our work in the future.

Dr. Gray's remarks on pyeloscopy are certainly appreciated. I think any one who knows Dr. Manges' work, realizes how valuable pyeloscopy is. One, however, encounters difficulties which render it impossible as a routine procedure.

We do not advocate the administration of a purgative as a routine procedure because in most instances it is unnecessary. When, however, we find the plates unsatisfactory on account of fecal accumulation, castor oil is prescribed, and additional plates are made.

Dr. Groover's remarks in reference to pneumoperitoneum, I think, are very timely. We have been practising pneumo-peritoneum in some of our tumors of the kidney. We have not done it however in connection with pyeloscopy. I think that opens up a wide field for future work.

Dr. Goldstein (closing).—I appreciated Dr. Gray's remarks but he must not forget that in our statistics we have reported 148 positive out of 152 cases. That is almost 98.5 per cent. If you can adopt any other procedure whereby you can get a greater percentage, we shall be very glad to accept it. It seems to me that 98.5 per cent positive diagnoses is sufficient proof that a certain method is working very nicely.

In regard to the kinks he mentioned, we showed only one case of a kink. In the 152 cases positively diagnosesd, there was only one diagnosed as kink. We had withdrawn our catheter before taking the pyelogram. Therefore, that seems to me would rule out kinks except in the case that I have shown.

For ureteropyelography we always use a radiographic catheter. If it is a good soft catheter we usually have no trouble in getting it up to the pelvis of the kidney. The one case that was shown as a kink was proven at operation to be a kink. It was adherent to the surrounding tissue and the man had definite symptoms which were relieved after operation.

Issue was taken with me on the injecting method. I have used the injecting method in over 700 cases in the past two years without any bad effects at all. There is no reason in the world why we cannot get just as good a pyelogram by the injecting method as you get with the gravity method if certain points of technic are observed. The fact that Dr. Armentrout mentioned about attaching the syringe to the needle and withdrawing some of the fluid, I have been doing for two years. I also determine renal pelvic capacity, which is the principal thing. If you determine the renal pelvic capacity with salt solution by injecting slowly to the point of fullness and allow that fluid to drain out, not by guess but by measurement, there will be very little pain.

Dr. Gray.—How do you tell whether it is full or not?

Dr. Goldstein.—The patient has the feeling of fulness. Then inject two or three cc. less than capacity of your opaque solution, whether it be thorium, sodium iodid, or collargol, and have your pyelogram made. Allow that fluid to run out by actual measurement, then wash out the kidney with sterile water. We allow patients to come into the clinic, take the pyelogram, and go home or to the office, and they never get a ureteral colic attack.

The most important procedure is to determine the renal pelvic capacity and then wash out the pelvis, removing the solution you have used for the pyelogram.

THE NAUSEA AND VOMITING OF PREGNANCY*

By James R. Garber, M.D.,
Birmingham, Ala.

It occurred to me that a discussion of the "nausea and vomiting of pregnancy" would be timely, as it is becoming a distinct entity in midwifery and, because of its significance, is worthy of our studious and respectful attention.

Most authors classify the nausea and vomiting of pregnancy as simply a toxemia, but to me such a broad classification is confusing and tends to becloud the effort at differentiation. For the sake of practical clinical value I make the following arbitrary distinction in the toxemias of pregnancy: eclampsia, with or without convulsions, is a toxemia incident to renal insufficiency, the end-results of faulty elimination, while, on the other hand, the nausea and vomiting of pregnancy is a true acidosis due to hepatic insufficiency, the end-result of disturbed metabolism, in which the oxidizing function of the liver and the products for oxidization are out of harmony. Such a division of the term "toxemia of pregnancy" does not lead me into error as the rationale of treatment, under such mental workings, seems to subscribe the "quod erat demonstrandum" to the problem. With this classification in mind, it is my purpose to ignore the renal toxemia or the eclamptic state and delve into the ramifications of the studies incident to the hepatic toxemia or acidosis state. It is just possible that many of the postulates I have and shall advance will be construed as rank heresy; but, be that as it may, I am willing to be among those who break away from the orgies of custom and the unsoundness of precedent if new thought and individual action will lead to self sufficiency and the proper initiative and concept of working hypotheses.

In the construction of the bodily temples the all-wise Creator endowed the liver with several functions, chief of which, in

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this connection, is that of glycogen storage. It is admitted that each liver function is a necessary link in maintaining the metabolic equilibrium during pregnancy, but it is the glycogenetic work that suffers in cases of hyperemesis gravidarum and is of paramount import in this analysis. And why? The research student has clearly demonstrated the excessive demand for glycogen made by the uterus and fetus in early pregnancy, thus arguing that much of the oxidization incident to the development of the early ovum takes place within the uterine cavity. As a net result, the glycogen storehouse of the liver is depleted, and may it not be contended that this deficiency precipitates a crisis in metabolism, which in turn elaborates such products as to initiate the tide of nausea and vomiting? As this cycle is established there is less chance of the patient's ingesting sufficient foods calculated to form glycogen, thus overcoming the balance in the equation of supply and demand for glycogen.

The verdict of flighty imagination and illogical reasoning could not be returned against the physician who declares a difference in the clinical picture of renal and hepatic toxemia. In the first instance (renal toxemia) the characteristic swelling, pallor, urinary changes, blood tension symptoms, the obstinate constipation, the persistent frontal headache, visual disturbances, stupor and vomiting are observed; while in the latter cases the presence of parched, red lips and tongue, constant vomiting and emesis aggravated by food, medicines and liquids, rapid loss of weight, nervousness stimulating a tremor, restlessness, sweetish odor to the breath, tenderness over the hepatic area and finding of acetone in the urine furnishes a picture of striking contrast. In the first instance, renal toxemia, the failure of the emunctory organs to function, precipitates the physical changes, and here permit the frank opinion of the writer in asserting his disbelief in the time-honored, shop-worn phrase "faulty metabolism" as answering the whys and wherefores of this type of toxemia. Hastily review the outline of accepted and standard treatment of eclampsia, with or without convulsions, and it will be seen that total restriction of food is practiced with forced elimination, and even though the exact nature of the products causing such a toxemia is not known, yet it is univerally agreed that the same rarely develops in cases that maintain satisfactory elimination. On the other hand, in the presence of good elimination, the hepatic toxemia develops and at an earlier period of gestation when the extra demands of pregnancy do not tax the emunctory organs, thus causing a retention of waste products. The foregoing assertions appear to be conclusive and if for no other reason than for convenience, this distinction could be borne in mind when called upon to be the broker through whom the elimination of data must proceed for the purpose of establishing diagnosis and treatment.

One of the greatest assets that a physician can possess is the power of observation and especially is this true in the performance of obstetrical work. In analyzing cold clinical facts, there must be studious and solicitous regard paid to all types of circumstances, extenuating or existing. Hence, the necessity of quickly and definitely determining the cause of hyperemesis gravidarum whether it be toxic, reflex or neurotic. In passing, the writer cannot refrain from calling attention to the absence of "reflex" causes of the nausea and vomiting of pregnancy in his experience, even though cases have been complicated by peptic ulcer, stomach prolapsed into the left iliac fossa, cholelithiasis, tubal disorders, ovarian cysts, cervical lacerations and the like. Such cases have not had the nausea and vomiting. And further, the writer has failed to note the same degree of toxicity of the patient in cases of hepatic origin as compared with those traceable to the kidneys. The latter cases lead in toxicity by many degrees.

Having, then, set forth the clear definition of hyperemesis gravidarum as an acidosis which is founded upon the arrested physiology of the liver, in contradistinction to disordered physiology or pathology, and having coded the distinct symptomatology of renal and hepatic toxemia as well as enumerated the types of the latter, let us direct our attention to the treatment of this condition. In the main this consists of

(1) HOSPITALIZATION

It is a well known fact that sympathetic attention may be the undoing of a sick person's progress, and surely where despondency and melancholia are as omnipresent as in cases of hyperemesis gravidarum such ministrations on the part of loved ones are baneful, to say the least. In fact, the continuous pleadings, "my wife can't stand this much longer," or "something must be done," or "she vomits all the time, nothing but green bile and thick slime," eventually sift into the sick chamber and cause a marked reaction and unsavory disturbance in the mental tranquility and emotional condition of a woman who is in dire need of encouragement and assurance. Hospitalization insures complete mental and nervous relaxation with the necessary freedom from domestic cares, whatever may be their nature. It deprives the patient of a constant report of herself, in which instance, she busies her mind about other things, and still more fortunately, the rigid and complete isolation that should be instituted removes the stage for the acting that may have been for the benefit of the bereaved family or for the sake of consistency, a suggestion of one or the other being observed in a majority of cases.

(2) REST IN BED

There can be no middle ground in this instance. The law must be absolute, except for the occasion of daily tub baths. The important point to weigh is the avoidance of fatigue upon a mechanism that falters as a result of excessive demands being made upon every system of that organism.

(3) ELIMINATION

This phase of the treatment does not form the important link as in the toxemia of renal origin, eclampsia, except in the prophylactic consideration. On the contrary, purgation and active diaphoresis are to be avoided, as the loss of body fluids is too greatly influenced by the actual emesis of stomach contents and the inability to ingest liquids. In pronounced cases, the enemata is the only means of procuring the necessary daily evacuation of the bowels, while in less severe cases the administration of mild laxatives as lapactic pills, milk of magnesia, cascara are beneficial. Especially would it be suggested that the attendant refrain from the use of calomel and depleting drugs as saline cathartics and the well known hydrogogue cathartics. As mentioned above, active sweating is not to be procured in these cases. Therefore a tub bath at 100 to 104°F. twice daily, followed by a light massage, will keep the skin functioning satisfactorily and will also have a sedative and comforting effect upon a weary body. In passing, it must be stated that the patient must not be permitted to exert herself in taking the bath.

(4) THE DIET

At the outset, it was shown what a great demand is made for glycogen during pregnancy, therefore it seems logical to force a carbohydrate diet upon the woman suffering from nausea and vomiting. All fats and proteins should be totally restricted and when they are reinstated it should be done judiciously and slowly. When the treatment is begun, everything by mouth, including ice and water, should be withheld for no less than eighteen and for possibly thirty hours. At no time should the diet be discussed with the patient and food should be offered in very small quantities, at frequent intervals and in a most pleasing manner. Sweet milk, except for cereals, is not desirable, although fresh buttermilk is permissible. During each twenty-four hours, effort should be made to have the patient take at least one litre of 10% lactose solution by mouth. In severe cases, lactose and glucose may be used in protoclysis and intravenously.

(5) MEDICINES

In the hands of the writer, the actual employment of drugs is virtually nil. Chloral hydrate in xx to xxx gr. doses, per rectum, is the only one administered, and this, irrespective of indications, only for the first two or three days. The use of opium should be tabooed, since unless my experience is unusual, it will invariably aggravate the condition. I am sure a number of vomiting cases have to be treated for too much morphin rather than for the actual condition complicating pregnancy. Glucose and salt solution per rectum and alkalis by mouth and rectum may do no harm, but are seldom employed by the writer in the plan of treatment as outlined herein.

(6) CORPUS LUTEUM

One of the most brilliant advances made in therapy, as it is employed in obstetrics, has been the development of corpora lutea in cases of hyperemesis gravdarum. It is to Dr. J. C. Hirst, of Philadelphia, that we must feel a deep obligation, for it was through his persistence and initiative that the practical value of this preparation was first demonstrated. It is with but a suggestive tinge of apprehension that the broad statement of its specificity, in conjunction with the above stated requirements, can be made and as its evolution is further unraveled there will be every reason to promote this form of therapy to fields of usefulness and definiteness in the care of maternity cases.

It is impractical to suggest or declare a definite outline as to the amount of corpora lutea to be given, as each case must furnish an index of its own just as the administration of drugs in other medical conditions is governed by the clinical findings. In the administration of corpora lutea there is that something about the case and that something about the doctor that determines whether 1 c. c is to be given once daily or once every other day or twice or thrice daily or every two days or 2 to 3 c. c. per diem for three days, and then 1 c. c per diem thereafter, or for a series of 6 to 12 to 18 c. c., or to the point of toleration as manifested by erythema multiforme. The writer has employed it in every manner enumerated above and believes the best routine is to inject 1 c. c. twice daily for three days, then 1 c. c once daily for six days, and if advisable, 1 c. c. every other day for six doses. The reaction varies, the average time of occurrence being observed about the sixth to eighth dose, on the last schedule mentioned, and the average total amount given is 12 c. c.

In the administration of this extract from a gland of internal secretion, it is not within the intent of this paper to claim for this procedure the virtues of a panacea. It is readily admitted that isolation, absolute rest, elimination and proper diet are as essential in promoting the salutary effects of corpora lutea as in the secretion itself. Furthermore, it must be declared that in the scope of this paper there has been no effort to belittle the importance of the ammonia co-efficient determination and other laboratory work in such cases or to make light of the gravity of a profound toxic case of nausea and vomiting. It is argued, however, that many such cases can be prevented by this particular work, in time, and even though advanced, may be entirely relieved or materially benefited. It has been my good fortune to have the opportunity of combatting some rather aggravated, stubborn and advanced cases of nausea and vomiting, in some instances where therapeutic abortions have been performed for a similar condition, and to date there has been but one case demanding an interruption of pregnancy. This record includes a period of seven years in private practice and as visiting and consulting obstetrician in three hospitals. The therapeutic abortion for hyperemesis gravidarum will always remain a classical procedure and in the career of every physician doing obstetrical work these Waterloos will be met, but, that these occasions can be appreciably curtailed and womankind relieved of such hardships by the more constructive and intensive work on every case of pregnancy, is the axiom that I declare and defend today.

SUMMARY

(1) There is justification for the arbitrary division of the term, "toxemia of pregnancy."

(2) The toxemia of pregnancy, termed "acidosis," is primarily an hepatic disturbance due to the disturbed glycogenetic function of the liver, and while pathology is present in the liver, it is secondary to disordered function. Hence, arises the desire to attribute the condition to arrested physiology rather than to morbid physiology of the liver.

(3) The toxemia of pregnancy, termed "eclampsia," is a condition directly attributable to faulty elimination whether it be due to the inactivities of the emunctory organs of the mother or to placental disturbances, as infarction, abruptio placenta and the like.

(4) The treatment consists in:

(a) Hospitalization with complete physical and mental relaxation by absolute rest in bed and rigid isolation.

(b) Elimination by tub bath, enemas and mild laxatives. Do not use saline cathartics or hydrogogue cathartics

(c) Restriction of everything by mouth for 18 to 36 hours at outset of treatment.

(d) Force carbo-hydrate diet. Omit proteins, fats and acids.

(e) Chloral hydrate per rectum for first 36 hours, independent of indications. There is apparently no need for administration of alkalis and it can be asserted most emphatically that when morphin is employed the condition is aggravated.

(f) Ten per cent lactose solution, by mouth, after initial withdrawal of food and fluids.

(g) Corpus luteum administered according to exigencies of the case.

(h) The efficacy of corpus luteum is not absolute, per se, but approaches the dignity and certainty of a specific when correlated with the other postulates of the treatment as herein outlined.

(i) The ammonia coefficient determination and other laboratory tests are not to be relegated to the attic. All such aid is important. This paper merely deals with the clinical handling of hyperemesis gravidarum.

CASE REPORTS

Case 1.—Mrs. C. W., age 22, nullipara, 36 weeks pregnant. Seen in consultation on the night of April 5, 1919. The following data were obtained: the patient had been treated at her home in Sand Mountain, Ala., for ten days prior to entering hospital in Birmingham where she had been for one week prior to my seeing her. She was constantly nauseated and vomited, had every mark of acidosis. Had been treated with calomel, morphin, soda and glucose but with no results. Diet had consisted of milk soups and albumins whenever patient was able to retain food. Urine showed heavy ring of acetone and diacetic acid was present. She was placed on the following treatment for the first 24 hours: absolutely nothing by mouth; hot tub bath in A. M. and P. M., chloral hydrate grs. xxx per rectum, at night and grs. x in A. M., 1 c. c. corpora lutea t. i. d. On the night of April 6 patient was improved and acetone in urine about same. A cereal and Irish potato soup were offered in small quantity and both were retained. The 10% lactose solution by mouth was then begun, giving 1 litre in 24 hours. Chloral hydrate grs. x given, per rectum, at night. Following day great improvement. Corpora lutea was given t. i. d., carbo-hydrate diet pushed; baths continued. On April 7 patient had extensive erythema multiforme, otherwise steadily improving; so, corpora lutea was given but once daily after this period. On evening of April 7 patient sat up for a short time. Next day she was rolled, in a chair, upon the lawn of the hospital. On April 11 discharged from the hospital. She was advised to restrict fats and proteins in the diet and to continue other hygienic measures. The total corpora lutea administered was 12 c. c. as follows: 3 c. c. per day for 2 days; 1 c. c. per day for 6 days. On May 21 the patient was delivered of a 7-lb. baby girl and after the discharge from the hospital in April had no further symptoms of hyperemesis gravidarum.

Case 11.—Mrs. T. W., age 34, multipara. First seen on Dec. 6, 1919, when she was five weeks pregnant and just beginning with nausea and vomiting that was constant and quite pronounced during the day and night. This patient had had two therapeutic abortions performed for hyperemesis gravidarum subsequent to the delivery of her first and only child who was then four years of age. I yielded to the importunities of the husband and substituted home treatment for the hospital. The treatment was identical with that outlined in Case 1 of this report. Only partial results were obtained after one week, but they were sufficient to cause me to dismiss the case from active attention. Total corpora lutea administered: 2 c. c. per diem for 3 days; 1 c. c. for 3 days; 1 c. c. every two days for 4 doses. At the end of 10 days the patient relapsed into the nausea and vomiting simulating the first attack. She was removed to the hospital immediately where isolation was complete. Rest was induced by chloral hydrate administered twice daily, carbohydrate diet forced and baths given twice daily. At the end of a week the patient was able to ride home in an automobile. From that time until delivered of an 8-lb. baby boy on July 22, 1920, the patient had no return of the hyperemesis gravidarum, but, on the contrary, has gained more flesh and felt better than at any other period of her life. The hygiene of pregnancy was carefully preached to her and the diet so restricted for 6 weeks as to ward off a return of the acidosis. Total corpora lutea administered during the second treatment was 8 doses or 2 c. c. twice a day for 4 days.

Woodward Building.

DISCUSSION

Dr. Otto Schwarz, St. Louis, Mo.—The point that Dr. Garber mentioned concerning glycogen deficiency of the liver as a factor in the production of the lesion of pernicious vomiting is of considerable importance and should be emphasized. It is well known in case of chloroform poisoning that a lesion is produced in the liver, a central necrosis, which is quite analagous to the lesion seen in pernicious vomiting. Whipple and Sperry call attention to the fact that pups are less susceptible to chloroform than adult dogs, liver necrosis being very difficult to produce in pups. Graham states that the relative difficulty with which characteristic central lobular liver necrosis can be produced in young pups after chloroform administration is in some way referable to the high glycogen content of their livers. He found that pups can readily be made to show central liver necrosis if they have been starved prior to the administration of chloroform. He also mentions that the effect of carbohydrates on adult animals lessens their suscepti-

bility to the production of liver necrosis by chloroform. Opie points out that a diet rich in carbo-hydrates protects parenchymatous cells of the liver from necrosis caused by chloroform. Therefore on account of similarity of these lesions the use of a rich carbohydrate diet in the first and second months of pregnancy may do much to prevent cases of toxemic vomiting of pregnancy.

Dr. E. Lee Dorsett, St. Louis, Mo.—In my hands the best results have been obtained by the intravenous use of sodium bicarbonate and glucose solution. In a case of pernicious vomiting in a primipara of 28 weeks gestation, I was able to control the condition until she reached 34 weeks, when I induced labor and obtained a 5½-pound living child. In this case there was only a low per cent of albumen but the blood pressure ranged from 146-166 and there was a high percentage of acetone present in the urine. After delivery the condition entirely disappeared, for fortunately there were no destructive charges in either liver or kidneys.

Dr. George Clark Mosher, Kansas City, Mo.—We have had at the Christian Church Hospital and the General Hospital in Kansas City a great number of cases of toxemia of the various types since the advent of the great war. We have concluded that all toxemias must include in their etiology some element of mental disturbance, in addition to the focal infection and the interference with metabolism, due to the lack of ovarian function during pregnancy.

As Dr. Garber says, these cases must be treated by discriminating the forms of toxic change which are manifested.

Since the paper of Dr. John C. Hirst on the use of corpus luteum pushed to the degree of tolerance, we have had under our care fourteen cases of what we styled pernicious vomiting; that is, cases which went beyond the stage of discomfort and became more or less alarming from the point of view of the patient. Of these, two failed utterly to respond to the corpus luteum; ten were cleared up at once and two relieved but still continued to vomit occasionally.

We cannot believe such results are mere coincidence.

Dr. S. M. Scott, Oakdale, La.—I should like to ask if the Doctor does not make a Wassermann on his bad cases. I have used the corpus luteum for a number of years with splendid results especially when on a carbohydrate diet.

Dr. Edward Speidel, Louisville, Ky.—To my mind every case of hyperemesis is both toxic and neurotic and in consequence of a number of disastrous experiences I now use extremely drastic measures at once in all cases referred to me. Of extreme importance is isolation of the patient in charge of a competent nurse, with the husband especially kept away. Rectal feeding with a glucose, sodium bicarbonate and beef peptonoids solutions is then started at once, about 3 pints being administered by the Murphy drop method every 24 hours. One or two tablespoonfuls of a solution containing 20 grains of chloral and 40 grains of bromid of sodium are added to the solution to keep the patient quiet. After a week, stomach lavage with bicarbonate of soda solution is practiced, then oral feeding gradually takes the place of the rectal feeding. I have used corpus luteum ampules hyperdermically in every case but do not know whether they have had any definite effect or not.

If the patient is not able to retain food after this rigid regime, then I feel that I have a clear indication for interrupting that pregnancy.

Dr. E. C. Cartledge, Atlanta, Ga.—I am sure I have relieved, very appreciably, this distress of pregnancy by the institution of those same measures which we use to relieve pelvic inflammation and engorgement and irritation from other causes, viz.:

(1) Sufficient rest (after meals and before) in bed with head no higher than pelvis;

(2) Occupying a room on ground floor so that there are no steps to climb;

(3) The use of magnesium sulphate p. r. n.;

(4) The leaving off corset or maternity supports, which really have no place, nausea or not;

(5) Wearing of slippers or flat heel shoes;

(6) Local depletory vaginal cones or tampons, especially if local tenderness or cervical erosions are present.

All of us know that these patients take their breakfast better in bed and that the nausea is worse after getting up.

I am mindful that prospective mothers need as little coddling as possible, but rather the active out of doors.

Dr. Garber (closing).—It was my endeavor to bring out two points of interest and of importance in the paper, viz.: first, that there should be a distinct differentiation in the term "toxemia of pregnancy," including renal and hepatic disturbances, respectively. The conditions actually exist, so why not be academic and make a practical application of clinical knowledge. Second, that the use of "corpus luteum" alone is not the with-all and end-all of the treatment of the nausea and vomiting of pregnancy, but that isolation, proper rest, elimination and diet are equally essential. With these facts in mind I have been able to cope with hyperemesis gravidarum in a most satisfactory manner.

EYE, EAR, NOSE AND THROAT

ELIMINATIVE SUBJECTIVE TESTING FOR GLASSES*

By Chas. A. Bahn, M.D.,
New Orleans, La.

No desire exists to place the following before you as something new. I realize that these ideas and methods have, at least in part, been used by every successful ophthalmologist. My efforts are offered as the outgrowth of an ideal to aid in the simplification and standardization of subjective testing, to help make it better, easier, and quicker.

The purpose of subjective testing is the determination, by the best, easiest, and quickest manner, of the one lens combination which positively affords the greatest vision.

By means of an approximation, preferably retinoscopic, the innumerable lens possibilities are reduced to comparatively few; and by the method described, these can usually be reduced to the one best vision lens within three minutes. This is, perhaps, best accomplished by the presentation of certain freely movable lenses, or test units, applied in front of more or less stationary approximations, or approximate tests; the first of which is the net retinoscopic finding, and each succeeding approximate test affords better vision and is a closer approach to the one best vision lens than the preceding. Test units and approximate tests theoretically contain in the different combinations every possible lens combination and in the course of the tests, are gradually, by elimination, reduced to the one best vision lens.

A retinoscopic approximation can differ from the one best vision lens in but four respects: first, it may contain too much or too little sphere; second, it may contain too much or too little cylinder; third, too much sphere with too little cylinder, as from plus .50 Diopt. sph. with a plus .50 Diopt. cyl. to plus .75 Diopt. sph. with a plus .25 Diopt. cylinder, or too little sphere with too much cylinder, as from plus .50 Diopt. sph. plus with a plus .50 Diopt. cyl. to a plus .25 Diopt. sph. with a plus .75 Diopt. cyl.; fourth, by having an inclination of axis too far to the right or left.

To facilitate speed and accuracy of examination, it is desirable:

(1) That definite strength test units in plus and minus, spherical and cylindrical, .25 Diopt., .50 Diopt., .75 Diopt., be employed, depending upon the visual acuity, the stronger test units being used for the lower visions, because poor sight and large errors of refraction are best measured in greater units. The mounting of these test units with handles aids in their rapid presentation before the trial frame or phorometer, which contains the approximate test;

(2) That the patient use as a basis of comparison, any letter of the lowest readable line;

(3) That not more than ten comparisons be required of an eye in immediate succession;

(4) That the patient be instructed to answer only better or worse after each glass as compared with the preceding glass;

(5) That the test units usually be presented in the following order: a plus sphere, b minus sphere, c plus cylinder at retinoscopic axis, d plus cylinder at reverse axis, e minus cylinder at retinoscopic axis, f minus cylinder at reverse axis, g change of axis inclination from the retinoscopic finding, both to the right and left, a definite number of degrees depending on the strength of the cylindrical portion of the correction.

The strength of units which apparently afford the best results in most cases are: for visions of 20/30 or better, plus .25 Diopt. sph., minus .25 Diopt. sph., plus .25 Diopt. cyl., minus .25 Diopt. cyl.; for visions of between 20/30 and 20/70, plus .50 Diopt. sph., minus .50 Diopt. sph., plus .50 Diopt. cyl., minus .50 Diopt. cyl.; and for visions below 20/70, .75 Diopt. units in plus

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and minus sphere and cylinder. The most satisfactory changes of axis inclination usually are: for cylinders of .25 Diopt., 28 degrees; for cylinders of .50 Diopt., 18 degrees; for cylinders of 75 Diopt., 9 degrees, and for cylinders of 1.50 Diopt. or more, 5 degrees. This means testing in units of 15, 10, 5, and 3 degrees respectively.

Generally speaking the method of procedure is as follows: The retinoscopic correction is placed in the trial frame or phorometer before the right eye, the left being covered. The patient is requested to call any letter of the lowest readable line, and instructed to answer only better or worse after each glass as compared with the preceding glass. If the vision is 20/30 or greater, .25 Diopt. units are used; if between 20/30 and 20/70, .50 Diopt. units are used, etc. The plus sphere unit of appropriate strength is first presented. A comparison is requested on the application and withdrawal of every test unit, thereby securing two comparisons for each test unit. If the patient answers better on the application and worse on the withdrawal of any test unit, it is incorporated in the trial frame or phorometer, forming a second approximate test or second approach to the one best vision lens. On the incorporation of the second approximate test, the patient should answer better as compared with the first approximation or retinoscopy. Plus sphere units are continued until the patient answers worse. If plus sphere units improve vision, the presentation of minus sphere units are not necessary; if not, minus sphere units are presented as described for plus sphere units.

The plus cylinder unit of appropriate strength is next applied at retinoscopic axis. If the vision is improved, it is incorporated in the trial frame forming a third approximate test, which affords better vision than the second approximate test. Plus cylinder units are continued at retinoscopic axis until the vision is diminished, the patient having answered worse on presentation and better on withdrawal.

The plus cylinder is then presented at reverse axis; which in plus on plus combinations, simultaneously increases the spherical and decreases the cylindrical part of the correction. Thus,

Plus 1.00 sph. plus .50 cyl. x90 combined with plus .25 cyl. x180 equals plus 1.25 sph. plus .25 cyl. x90.

In minus on minus combinations, the application of the plus cylinder unit at reverse axis decreases the spherical and increases the cylindrical part of the combination. Thus,

Minus 1.00 sph. minus .50 cyl. x90 combined with plus 25 cyl. x180 equals minus 75 sph. minus .75 cyl. x90.

In minus on plus combinations with a plus cylinder, both the spherical and the cylindrical part of the combination are thus decreased. That is,

Minus 1.00 sph. plus 3.00 cyl. x90 combined with plus 25 cyl. x180 equals minus .75 sph. plus 2.75 cyl. x90.

The minus cylinder unit is then applied at the retinoscopic axis. If this does not improve vision, that is, if the patient answers worse on presentation and better on withdrawal, it is applied at reverse axis; which, in plus on plus combinations, decreases the spherical and increases the cylindrical part of the correction. Hence,

Plus 1.00 sph. plus 50 cyl. x90 combined with minus 25 cyl. x180 equals plus .75 sph. plus .75 cyl. x90.

In minus on minus combinations, the minus cylinder at reverse axis increases the spherical and decreases the cylindrical part of the correction. Hence,

Minus 1.00 sph. minus 50 cyl. x90 combined with minus 25 cyl. x 180 equals minus 1.25 sph. minus .25 cyl. x 90.

In minus on plus combinations with a plus cylinder, both the spherical and the cylindrical part of the correction are thus increased. Hence,

Minus 1.00 sph. plus 3.00 cyl. x90 combined with minus .25 cyl. x 180 equals minus 1.25 sph. plus 3.25 cyl. x 90.

If the patient is unable to answer better or worse, this would indicate that the test unit is too weak for the individual's sense of comparison; or that the test unit is exactly twice the proper strength, that is, under or over corrects as much as was previously over or under corrected; or, that the patient is not sufficiently attentive; usually the last named.

The cylinder unit should be smaller than the cylinder of the approximate test, unless, of course, the latter contains no cylinder, in which case, plus and minus .25 Diopt. cylinder units should be presented at axis 45 and 90, and at correspondingly reverse axis.

The more accurate the retinoscopy, the fewer combinations will have to be eliminated; hence, the faster, simpler, and more accurate will be the determination of the one best vision lens.

In a case of hyperopic astigmia, for example, with a retinoscopy of plus 1.00 sph. plus 1.00 cyl. x 90 and with a vision of 20/40, the plus .50 sph. unit is first presented because the plus sphere unit is the first step of the test and .50 Diopt. is the most appropriate strength for visions of between 20/30 and 20/70. Let us suppose the patient answers better on presentation and worse on withdrawal. The above unit is now incorporated in the trial frame forming a second approximation of plus 1.50 sph. plus 1.00 cyl. x 90. Hence,

Plus 1.00 sph. plus 1.00 cyl. x 90 combined with plus .50 sph. equals plus 1.50 sph. plus 1.00 cyl. x 90.

This, let us suppose, affords better vision, say 20/30, than the first retinoscopic finding or first approximate test of plus 1.00 sph. plus 1.00 cyl. x 90. Because of the 20/30 vision, and because the plus sphere test unit previously improved vision the plus 25 sph. unit is then applied, to which the patient answers, let us suppose, worse on presentation and better on withdrawal. Thus,

Plus 1.50 sph. plus 1.25 cyl. x 90 combined with plus .25 sph. equals plus 1.75 sph. plus 1.00 cyl. x90.

Further increase of sphere has thus been eliminated. The application of the minus sphere test unit is not necessary because the plus sphere test units previously employed, improved vision. Decrease of plus sphere has thus been eliminated. The plus .25 Diopt. cylinder unit is now presented at axis 90 in front of the second approximation, plus 1.50 sph. plus 1.00 cyl. x 90, to which the patient, let us suppose, answers better on presentation and worse on withdrawal. The plus .25 cylinder unit is now incorporated in the trial frame, giving a third approximation of plus 1.50 sph. plus 1.25 cylinder x 90, to which the patient must answer better on incorporation, as compared with the second approximation of plus 1.50 sph. plus 1.00 cyl. x 90. Thus:

Plus 1.50 sph. plus 1.00 cyl. x 90 combined with plus .25 cyl. x 90 equals plus 1.50 sph. plus 1.25 cyl. x 90.

The plus .25 cylinder unit is again applied at axis 90 because the previous plus cylinder unit improved vision at that axis; upon which the patient answers, let us suppose, worse on application and better on withdrawal. Hence,

Plus 1.50 sph. plus 1.25 cyl. x 90 combined with plus 25 cyl. x90 equals plus 1.50 sph. plus 1.50 cyl. x 90.

Further increase of plus cylinder at retinoscopic axis has now been eliminated.

The handle of the plus .25 cylinder unit is now turned 90 degrees, thus reversing the axis; to which the patient answers, let us suppose, worse on presentation and better on withdrawal. Thus,

Plus 1.50 sph. plus 1.25 cyl. x 90 combined with plus .25 cyl. x180 equals plus 1.75 sph. plus 1.00 cyl. x 90.

Increase of sphere and decrease of cylinder has thus been eliminated. Decrease in the strength of the cylinder by the application of minus cylinder units at retinoscopic axis has been made unnecessary by the previous improvement with plus cylinder units at retinoscopic axis. Thus,

Plus 1.50 sph. plus 1.25 cyl. x90 combined with minus 25 cyl. x90 equals 1.50 sph. plus 1.00 cyl. x90.

The minus .25 cyl. test unit is then applied at reverse axis, to which the patient answers, worse on presentation and better on withdrawal. Thus,

Plus 1.50 sph. plus 1.25 cyl. x 90 combined with minus .25 cyl. x180 equals plus 1.25 sph. plus 1.50 cyl. x90.

Thus decrease of sphere with simultaneous increase of cylinder has been eliminated.

The inclination of axis is determined by movements both to the right and left, a definite number of degrees, depending upon the strength of the cylinder. The cylinder in this instance being plus 1.25 Diopt. the axis is inclined slightly less than 10 degrees, say, 9 degrees to the right,

from 90 to 81, to which the patient answers, say, better; then 9 degrees more to the right, from 81 to 72, to which the patient answers, say, worse; then 9 degrees to the left, from 72 to 81, which must be better, affording a vision of, let us suppose, 20/15. The direction of axis is thus determined. We now have the final test, plus 1.50 sph. plus 1.25 cyl. x 81, which the patient has stated at least twice gives better vision than any other possible lens combination.

In a case of myopic astigmia, for example, the retinoscopic finding or first approximate test, is, say, minus 1.00 sph. minus 1.00 cyl. x 90, affording a vision of 20/70. According to the outlines given the retinoscopic finding is placed in the trial frame and the plus .50 sphere unit is presented in front of it. Let us suppose it is rejected. Thus,

Minus 1.00 sph. minus 1.00 cyl. x90 combined with plus .50 sph. equals minus .50 sph. minus 1.00 cyl. x90.

Decrease of sphere has thus been eliminated. The minus .50 sphere test unit is applied and, let us suppose, accepted. Hence,

Minus 1.00 sph. minus 1.00 cyl. x90 combined with minus .50 sph. equals minus 1.50 sph. minus 1.00 cyl. x90.

The second approximate test is minus 1.50 sph. minus 1.00 cyl. x 90, which gives us supposedly a vision of 20/40. The minus .50 test unit is again applied and, let us suppose, rejected. Hence,

Minus 1.50 sph. minus 1.00 cyl. x90 combined with minus .50 sphere equals minus 2.00 sph. minus 1.00 cyl. x90.

Further increase of minus sphere has thus been eliminated. The plus .50 cylinder unit is now applied at axis 90 and, let us suppose, rejected. Thus,

Minus 1.00 sph. minus 1.00 cyl. x 90 combined with plus .50 cyl. x 90 equals minus 1.00 sph. minus .50 cyl. x 90.

Decrease of cylinder has thus been eliminated. The minus .50 cylinder unit is then applied at axis 90 and, let us suppose, accepted. Thus,

Minus 1.50 sph. minus 1.00 cyl. x90 combined with plus .50 cyl. x 90 equals minus 1.50 sph. minus 1.50 cyl. x90.

The third approximate test is minus 1.50 sph. minus 1.50 cyl. x 90, which we will suppose, gives a vision of 20/30. Having now obtained a vision of 20/30, further testing will be done with .25 Diopt. units.

The minus .25 cylinder unit is applied at axis 90 and, let us suppose, rejected. Thus,

Minus 1.50 sph. minus 1.00 cyl. x90 combined with minus .25 cyl. x90 equals minus 1.50 sph. minus 1.75 cyl. x90.

Further increase of cylinder at retinoscopic axis has thus been eliminated.

The minus 25 cyl. unit is now applied at reverse axis, or 180 degrees and is, let us suppose, accepted, giving a fourth approximate test of minus 1.75 sph. minus 1.25 cyl. x 90, with a vision of, say, 20/20. Thus.

Minus 1.50 sph. minus 1.50 cyl. x90 combined with minus .25 cyl. x180 equals minus 1.75 sph. minus 1.25 cyl. x90.

The minus .25 cyl. unit is again applied at axis 180 and, let us suppose, rejected Hence,

Minus 1.75 sph. minus 1.25 cyl. x90 combined with minus .25 cyl. x180 equals minus 2.00 sph. minus 1.00 cyl. x90.

Further increase of the spherical with simultaneous decrease of the cylindrical part of the correction has thus been eliminated. The cylinder being 1.25 Diopt. the axis is inclined to the right 9 degrees, from 90 to 81, which is, let us suppose, rejected; then back to 90 degrees, which must be accepted. Having eliminated decrease inclination of axis the cylinder is turned to the left 9 degrees, from 90 to 99, which, let us suppose, is accepted; then to 108 degrees, which is accepted as compared with 99; then to 117 degrees, which is rejected. Upon being returned to 108 degrees the axis must be accepted, the patient having answered better. Thus the axis has been determined in units of 5 degrees.

The final test or one best vision lens is minus 1.00 sph. minus 1.00 cyl. x 108.

If we are dealing with a case of mixed astigmia, for example, with a retinoscopy of minus 1.00 sph. plus 2.00 cyl. x 90 and a vision of 20/40; the plus .50 sph. unit is first applied and, let us suppose, rejected. Thus,

Minus 1.00 sph. plus 2.00 cyl. x90 combined with plus .50 sph. equals minus .50 sph. plus 2.00 cyl. x90.

Decrease of sphere has thus been eliminated. The minus .50 sph. test unit is then presented and, let us suppose, rejected. Thus,

Minus 1.00 sph. plus 2.00 cyl. x90 combined with minus .50 sph. equals minus 1.50 sph. plus 2.00 cyl. x90.

Increase of sphere has thus been eliminated. The plus .25 cylinder unit is then presented at axis 90 and, let us suppose, accepted with a vision of 20/30, thus making a second approximation of minus 1.00 sph. plus 2.25 cyl. x 90. Thus,

Minus 1.00 sph. plus 2.00 cyl. x90 combined with plus .25 cyl. x90 equals minus 1.00 sph. plus 2.25 cyl. x90.

The vision being 20/30 and the previous test unit having improved vision, the plus .25 cyl. is again presented at axis 90, and, let us suppose, rejected. Thus,

Minus 1.00 sph. plus 2.25 cyl. x90 combined with plus .25 cyl. x90 equals minus 1.00 sph. plus 2.50 cyl. x90.

Further increase of cylinder has thus been eliminated. The plus .25 cyl. unit is now presented at axis 180 and, let us suppose, rejected. Thus,

Minus 1.00 sph. plus 2.25 cyl. x90 combined with plus .25 cyl. x180 equals minus .75 sph. plus 2.00 cyl. x90.

It will be noted that both the sphere and cylinder were decreased by the plus cylinder presented at reverse axis.

Decrease of both sphere and cylinder have now been eliminated. The minus .25 cyl. unit is not necessary, because vision was improved by the plus .25 cyl. unit at the same axis. Thus,

Minus 1.00 sph. plus 2.25 cyl. x90 combined with minus .25 cyl. x90 equals minus 1.00 sph. plus 2.00 cyl. x90.

The minus .25 cyl. unit is now applied at axis 180, and, let us suppose, is accepted with a vision of 20/20, thus giving a third approximation of minus 1.25 sph. with a plus 2.50 cyl. x 90.

Minus 1.00 sph. plus 2.25 cyl. x90 combined with minus .25 cyl. x180 equals minus 1.25 sph. plus 2.50 cyl. x90.

The minus .25 cyl. unit is again applied at axis 180 and, let us suppose, rejected. Hence,

Minus 1.25 sph. plus 2.50 cyl. x90 combined with minus .25 cyl. x180 equals minus 1.50 sph. plus 2.75 cyl. x90.

The only practical way to increase the sphere with a simultaneous equal decrease of cylinder is in .25 units, by the presentation of a minus .25 sph. minus .25 cyl. x 90, which, let us suppose, is rejected. Thus,

Minus 1.25 sph. plus 2.50 cyl. x90 combined with minus .25 sph. minus .25 cyl. x 90 equals minus 1.50 sph. plus 2.25 cyl. x 90.

Decrease of sphere with simultaneous equal increase of cylinder is secured by the use of a plus .25 sph. plus .25 cyl. x 90 units. Thus,

Minus 1.25 sph. plus 2.50 cyl. x90 combined with plus .25 sph. plus .25 cyl. x 90 equals minus 1.00 sph. plus 2.75 cyl. x90.

Let us suppose this is rejected. Thus decrease of sphere with an increase of cylinder has been eliminated. The use of the cross cylinder does not in my opinion facilitate testing for reasons which will be later discussed.

The inclination of axis is now determined by turning the cylinder from 90 to 85, which, let us suppose, is rejected. Then it is moved back to 90, which must be accepted. Then it is moved from 90 to 95, which we will suppose is rejected, and back to 90, which must be accepted. Thus we arrive at the final test, minus 1.25 sph. plus 2.50 cyl. x 90, which the patient has stated at least twice gives better vision than any other possible lens combination.

The more accurate determination of axis inclination, that is, its measurement in smaller units, is sometimes facilitated by increasing the cylinder by .25 Diopt. during that part of the test. In the cases detailed the axis inclination unit has been used which was applicable for the large majority of similar cases. Many exceptions exist. Measurement in larger or smaller units may be necessary. The most accurate results are obtained by the smallest difference with which the patient will compare. It will be recalled that in many cases the mid-point between the total of the approximate test with and without the

test unit is actually measured. For example, where a given unit has improved vision producing another approximate test, and its further application is rejected, the mid-strength between the approximate test with the test unit is actually measured.

The use of the cross cylinder does not, in my opinion, facilitate testing, because its application produces in reality an unequal change in the spherical and cylindrical parts of the correction and because its presentation produces combinations which are hardly confusable with an approximate test; that is, are of such great difference as not to practically require elimination. Take a plus 1.00 sph. plus 1.00 cyl. x 90 for example, and add to it the .25 Diopt. cross cylinder. In one position we have,

Plus 1.00 sph. plus 1.00 cyl. x90 combined with plus .25 cyl. x 180 minus .25 cyl. x 90 equals plus 1.25 sph. plus .50 cyl. x 90.

A plus 1.25 sph. plus .50 cyl. x90 could hardly be classed as a confusable combination with a plus 1.00 sph. plus 1.00 cyl. x 90. Reverse the cross cylinder and an equally unique difference is produced.

Plus 1.00 sph. plus 1.00 cyl. x90 commined with plus .25 cyl. x90 minus .25 cyl. x 180 equals plus .75 sph. plus 1.50 cyl. x 90.

One would hardly present a plus .75 sph. plus 1.50 cyl. x90 immediately after a plus 1.00 sph. plus 1.00 cyl. x90 under ordinary circumstances. Why do it with a cross cylinder? In no case does the cross cylinder really increase the spherical and decrease the cylindrical part of the correction equally, or vice versa, because a part of the cylinder difference produced has to be neutralized by a portion of the spherical correction.

In practice most patients are required to wear corrections constantly for one month to relieve practically all eye strain all the time. At the end of the month, if relieved of eye strain, instructions are usually given to wear the glasses gradually less in order to determine the minimum use necessary.

The aim of what has preceded was, under cycloplegia, the one best vision lens. The prime consideration is its practical use. Broadly speaking, it is my practice to prescribe the one best vision lens in patients not having worn an approximate correction, less the following deduction:

For plus corrections spherical, cylindrical, or both, up to plus .50 sph. with a plus .50 cyl., plus .25 sph. is deducted; for corrections up to plus 1.00 sph. plus 1.00 cyl., plus .50 sph. is deducted; up to plus 3.00 sph. plus 2.00 cyl., plus .75 sph. plus .25 cyl. is deducted and for higher corrections plus 1.00 sph. plus .50 cyl.

For minus corrections, spherical, cylindrical, or both, up to minus 1.00 sph. minus 1.00 cyl.; minus .25 sph. is deducted; up to minus 3.00 sph. minus 2.00 cyl., minus .25 sph. minus .25 cyl. is usually deducted.

Marked deductions should be explained to the patient, as well as the probable necessity for an early change of glasses. The test of glasses prescribed is the duration of their comfortable use. One is often surprised at the long duration of comfortable use following properly prescribed lenses.

In a series of unselected cases under the age of 40, it seems thus far that atropine refraction affords more uniform successful tests in about 20% of cases than homatropin. The most satisfactory result with homatropin seems to be secured from one to two and a half hours after the last of not less than three installations of a 3% solution, preferably at five or ten minute intervals.

In my routine examination I secure a retinoscopy and two successive tests by the method described, under homatropin; all of which must correspond before glasses are prescribed. If the results of the two tests are not similar atropin is usually recommended. The routine use of homatropin gives the large number of patients the advantage of the less prolonged cycloplegic.

Broadly speaking, I believe that errors of more than 2.00 Diopt. sph. and 1.00 Diopt. cyl. are best refracted, at least the first time, under atropin; not only because of the greater sureness of successful tests and therefore greater accuracy, but because the use of atropin enables the patient to tide over that unpleasant period of adjustment to new glasses with the least dis-

comfort. Thus far, I am not able to select without the previous use of homatropin, the small errors which require atropin refraction.

In a series of unselected cases under 40 years, with and without cycloplegia, in over 70 per cent of the cases examined it would have been absolutely impossible to have prescribed without cycloplegia, proper glasses with any degree of accuracy, especially with regard to the strength or axis of the cylinder, which is unquestionably the most important part of any correction.

It would indeed be ungrateful to close without acknowledgement of the many ideas, opportunities for study, and valuable assistance given me by my teachers and friends, Doctors Henry Dixon Bruns and Marcus Feingold, both of New Orleans.

CONCLUSIONS

(1) There can be but one lens combination which positively affords the best vision.

(2) A retinoscopic approximation reduces the innumerable lens possibilities to a comparatively few. These can differ from the one best vision lens by containing: first, too much or too little sphere; second, too much or too little cylinder; third, too much sphere with too little cylinder, or too little sphere with too much cylinder; fourth, too great or small inclination of axis.

(3) The innumerable lens possibilities can be reduced to one group and to one lens combination of that group, usually in three minutes, and in the manner described, by means of easily changeable test units of definite strength presented in front of more or less stationary tests. The first approximate test is the net retinoscopic finding and each successive approximate test is a closer approach to the one best vision lens and affords better vision than the preceding approximate test.

(4) Definite strength test units are employed in plus and minus, sphere and cylinder, depending upon the visual acuity and definite strength axis units are employed for definite strength cylindrical corrections.

(5) It is advisable that the patient compares each glass only with the preceding, answering, "better" or "worse," employing any letter of the lowest readable line as a basis of comparison; that not over ten successive comparisons be required of an eye in immediate succession; and that comparisons be required both on presentation and withdrawal of test units.

(6) Test units which improve vision are incorporated in the trial frame or phorometer contents forming, with the net retinoscopic finding or first approximate test, other approximate tests, each of which afford better vision than the preceding.

(7) The last approximate test, or final test, represents the reduction of lens possibilities to one and is usually determined in three minutes. According to the patient's statement at least two times, the final test affords better vision than any other possible lens combination.

DISCUSSION

Dr. J. W. Jervey, Greenville, S. C.—The paper which Dr. Bahn read is one that should be read slowly and carefully digested in order to appreciate the value of the work that he has presented. It is impossible in a series of illustrations and minute tests rapidly run through to fully get the importance of the detail. Without doubt Dr. Bahn's presentation of the subject is the clearest and most accurate as well as useful and practical that I have ever had the pleasure of reading. There can be, I think, no criticism of his statement of facts or of the logic of his deductions, although many of us will perhaps think that we have our own little variations which perhaps save as much time as his and are equally as useful, and we may think that there are one or two things which he mentions casually that we would emphasize. For instance, in speaking of the best vision lens I do not think he brought out quite clearly that the best vision lens is the one which gives the best vision in the test after the effects of the cycloplegic have entirely disappeared. The correct estimate of the angle of the cylinder correction is oftentimes found under the cycloplegic and will tally with the retinoscope findings, and as long as the medium of the cycloplegic remains in force that angle of cylinder correction will hold good as the best vision lens. But so many of our patients have been for years uncorrected, or perhaps badly corrected, resulting in a certain amount of hypertrophy of the ciliary muscles, perhaps a few fibres in some particular angle, which causes a functional astigmatism that is very hard to overcome, and although you put correct lenses on the eye the patient is unwilling to accept them and will not go through the difficulty and discomfort necessary to use with benefit what we know is both diagnostically and practically the proper correction for the patient's eye. So that we can not determine the best vision lens until we have waited for every vestige of the cycloplegic to disappear from the eye.

One point he speaks of is very important to my mind, and that is being sure that the attention of the patient is centered on what he is doing. I have found that it so often happens that, although I may ask the patient to say immediately whether the vision is better or worse with a certain correction, yet when I ask him to read the test line I will find he is skipping from one line to that above, perhaps, and although he sees the line above a little better than he previously did the line below and will tell you he has better vision, as a matter of fact he has not. Necessarily, of course, the test case is the court of last resort. I think very few would under ordinary circumstances prescribe corrections until the last resort of the test units as Dr. Bahn has described has been applied.

I am glad to hear him say that he has gotten little satisfaction from testing with a cross clyinder. I have from time to time tried to see what I could get from it, but I have never had any satisfactory results from testing with the cross cylinder. Perhaps it is too complex for me, but I am glad to hear that Dr. Bahn has also come to this conclusion.

So far as cycloplegics for the patient forty years of age, I have found that I can not set any limit of age for the use of cycloplegics, because I often see patients forty-five to forty-eight who are able to read with perfect comfort.

But when all is said and done, while I think the scientific tests are guides to point out the way and make us do better work, still refraction must remain for the present at least, perhaps always, not only a science, but one that carries with it a large element of art, and that comes not from reading text-books, but from observation and the ability to size up the temperament of the patient in the acceptance of the correction.

Dr. Hilliard Wood, Nashville, Tenn.—The paper brings out the value of having a definite routine plan for reaching a definite conclusion. I believe it is better to have a definite plan, even if the plan is not always the best, than to try to refract without such a definite system. I believe that the plan which Dr. Bahn has presented is an exceptionally good one. I believe it is the best that I have ever heard presented.

With regard to some points brought out, first, his use of mydriatics and the mydriatic used. Of course we all know that the younger the patient the greater the need of some mydriatic, or rather cycloplegic. I do not believe that is wise as a rule to prescribe glasses in people under forty without some form of cycloplegic. As to the cycloplegic to be used, of course we all have our preference. Personally, for many years I have used scopolamin, preferring it to homatropin, because I feel it more thoroughly paralyzes the ciliary muscle than homatropin, and then the effect does not last so long as does the effect of atropin and the prolonged effect of atropin may become, as you know, under many conditions a serious objection. The strength of scopolamin which I have used for many years is one-tenth of 1 per cent, putting four or five drops in each eye twice at intervals of ten minutes, and waiting one hour from the time of the first instillation. I believe the cycloplegic effect on that plan has been fairly complete, possibly not so good as atropin, but workable at any rate. In refracting people under forty, or even forty-five years of age, as suggested by Dr. Jervey, I think that mydriatics should be used, especially for the first refraction. I have found it a great advantage to have definite measurements of the eye made at the first time under the cycloplegic, and it has not usually been necessary to repeat the cycloplegic if they come a few years later for further adjustments. I believe the cycloplegic should be used at first much more than at subsequent examinations.

Nothing has been said of the use of the ophthalmometer in measuring the astigmatic error. Personally, I have found it helpful to use it as a routine.

The doctor mentions another point which must have occurred to all of us, and that is in testing eyes by some prolonged test the patient's eyes get tired. He gets confused and can not tell whether a letter looks better or worse. It is all hazy. I have been in the habit of having him shut both eyes for ten or fifteen seconds and then try it again. I am glad the doctor brought out that point that prolonged testing is not wise. We should not go too far at one time. He also mentioned that where he is going to use spheres, plus and minus, he always uses the plus first. I think that is very valuable in that you do not excite the accommodation to begin with by the use of your minus sphere. We have all had the experience in refracting where we have put on, for example, a plus-50 cylinder, AX. 90, and it is questionable whether it improves the vision. But reverse that cylinder, make it 180. If the patient has no astigmatic error I dare say he will see just as well with the cylinder 90 as 180. It is the same cylinder reversed on its axis. If it makes no difference, do not change, but if it is worse, then correct the axis to 90. At least it is a clue on which to work.

In correcting old people beyond forty-five or fifty, and the older they are the more this statement is true, they are best left without cylinder correction. Take, for example, a man of fifty-five, who has never been corrected, and although our corrections may be technically correct, he is uncomfortable, and from his standpoint we had better leave the cylinder off and give him spherical correction. That rule does not hold good in young people and the younger they are the less it is true.

Something was said in passing about post-cycloplegic refraction. I believe that is eminently correct wherever it can be done, that is to say, in young people who live in town and who can drop in again after a few days and have a second adjustment without the cycloplegic. You will oftentimes get a modification of that glass, especially the sphere content, and you will get a correction that is very much more comfortable for your patient. More and more I have been in favor of post-cycloplegic refraction. Unfortunately, you can not use it conveniently in all cases, especially those who live out of the city, and the farther they live away, the less practical it is.

Dr. Milton J. Stern, Paris, Ky.—Nothing has been said of the Verhoeff charts. As you may know, Dr. Verhoeff has devised a set of charts

made of white cardboard with strips of black velvet ribbon pasted upon them. The first card is similar to the familiar astigmatic dial, however, differing in many particulars. The other card has two strips of ribbon at right angles to each other and is so constructed that they may be turned in any direction to correspond to the principal meridians of the eye. In use, the vision is first taken, then stronger and stronger plus lenses are added until the vision is reduced to about 20/100. Attention is now directed to the first card. If there is astigmatism present, one or more lines will appear more distinct than the remainder. The second card is set at the axis of the plainest line. Minus cylinders are added at the opposite axis until the two lines of this card are equally distinct. This method is particularly valuable for patients beyond the cycloplegic age. If you will use these charts, I think you will be surprised at the accuracy with which the amount and axis of the astigmatism can be determined.

Dr. Oscar Wilkinson, Washington, D. C.—The doctor laid stress upon the one right glass. I was rather surprised that he made no reference to the effects of the extra-ocular muscle. We certainly can not afford to lose sight of the imbalance of the extra-ocular muscles in these persons. For instance, in a case of exophoria we do not give as full hyperopic correction as in esophoria. Another consideration is that one right glass for vision does not always give the most relief to a case of hyperopia.

I first take the vision. I believe that it is very important to do a pre-cycloplegic examination. That is particularly necessary in cases that live out of town, say forty to one hundred miles from you. They want their glasses, and if you do a pre-cycloplegic examination, then the retinoscope under the cycloplegic you have a pretty good idea of what the patient is going to take. The choice of the cylinder is worked out this way: I take the vision without the glasses and a record of the same. Then I put on the high spheres and reduce until I bring the vision, say, to 6/6. I next reduce the sphere, say, a half diopter; then I put on a cylinder correction, and in order to get the axis for the cylinder you reduce the sphere below what you think it ought to be and increase the cylinder above what you think it ought to be. The increased cylinder allows a less variation in the turning of that cylinder when it is an over correction; in other words, if you have a half diopter of astigmatism and you put on a plus one cylinder, any amount of deviation from the correct axis will blur the vision considerably, and after you have decided the axis of the cylinder, then the next step is to turn the cylinder 90° from the position of correct axis. If with a +1.0 cyl. this blurs to 6/12 or more, the cylinder is not too strong. If the patient sees 6/9 or more, the cylinder is too strong. With careful precycloplegic work and careful use of the retinoscope we are enabled, after we have done our post-cycloplegic test, to prescribe glasses that will be comfortable.

Dr. George Maxwell, Roanoke, Va.—I think Dr. Bahn made one remark that is the cream of everything he said, and that is, "The more accurate the retinoscopy the less trouble you will have in getting the best one lens." Some men still refract without the retinoscope, but they are foolish, and the more we depend upon the retinoscope—which is an absolutely accurate test—the better results we will get. There are different ways of using the retinoscope, but if they only use this method it will save a whole lot of trouble. Use a trial test frame and put a plus one sphere in the back portion, seat your patient 40 centimeters from you, and then take accurate measurements. If the patient does not reach 20/20 vision take him back into the dark room and say you have made a mistake and do it over again. If the second time he does not reach 20/20, we look him over with the ophthalmocope to see the condition of the eye grounds. If we do not find any retinal or muscle trouble that would account for the defect in vision, we still say we have made a mistake with the retinoscope. If we would learn how to use the retinoscope accurately we would get a whole lot better results with less trouble than these subjective tests which worry the patient to death. The patient will say he sees better, and when you look you find he is looking two lines further up. The retinoscope is what you want to rely on.

Dr. C. A. Weiss, Baton Rouge, La.—One point the doctor mentioned I wish he would explain to us and that is whether or not he uses one letter or the whole line. It has been my experience that a good many patients pick out a letter that they see better than anything else, and I generally counteract that by telling them to pick out the letter they have the most trouble seeing. Then I correct them until they get that letter correctly.

I make an ante-cycloplegic examination because it gives valuable information both from the standpoint of future retinoscopy and as a matter of deduction. It is always a question how much to deduct from retinoscope findings. There is no set rule. It is the personal equation. But I think an ante-cycloplegic examination often gives us a guide to go by in our deductions.

Dr. Hiram Woods, Baltimore, Md.—I think the Section is to be congratulated upon this paper. Dr. Bahn has given a most careful analysis of methods of subjective testing, and it looks as though this same careful method which he has pursued and described is being generally followed. It indicates a great elevation in the method of thought with which we approach these cases.

I want to speak briefly of two or three little things. First, with reference to prolonged examinations. It seems to me a good deal of that is the examiner's own fault. You keep on repeating the same old questions and the patient soon learns the letters by heart. You do not get anywhere at all. A great deal can be accomplished by having them shut their eyes occasionally, and open behind the lenses. Then we give the examination under a cycloplegic. And incidentally, I want to say that we should distinguish in our talk between a mydriatic and a cycloplegic. Some men use the words interchangeably, but they are not interchangeable terms at all. But after you give the cycloplegic examination you have a good deal more to do. The essayist did not speak of muscular imbalance

cases in determining the amount of glass you are going to give. I wish he would do that. But so far as having any formula by which we can calculate how much of the total error we can correct (while the patient is still under the cycloplegic) if there is any reliable routine I have never found it out. There is only one way to do, and that is the pre-cycloplegic examination to which some one alluded, and a post-cycloplegic examination later on.

With reference to the cycloplegic, there is one valuable use I want to mention. You find a class of cases where even with the best you do you have either over-corrected or under-corrected the error. These patients come back when you have given them 20/15 with 20/40 a few weeks later. They are dissatisfied. You know perfectly well from the muscle balance that they will not get on well without that much help. You can help these patients by the use of homatropin in this way: Saturday night, one drop. They are ready for work Monday morning. The ciliary muscle relaxes and quickly recovers and they start fresh. In the course of three or four weeks you will be surprised how near you will come to correcting the total error.

One other thing. We make our examinations from a monocular point of view; the patient uses his eyes from a binocular standpoint. He is getting a different vision from what we worked out on our trial case. There is, I believe, on an average an improvement of about 20/20 to 20/15 or 20/12 on binocular examination over monocular examination, and for my own part I always like to get that improvement in binocular vision.

As to the variation in retinoscopy that Dr. Maxwell spoke of, we do find these cases. I think most cases are due to an irritable ciliary muscle or to deficient cycloplegia. You follow that with a little more cycloplegic or use a stronger one and you generally will come out all right.

Dr. D. D. McHenry, Oklahoma City, Okla.—One method the doctor did not mention which is valuable, and that is homatropin and cocaine over night, in high school and college students from sixteen to twenty-three. I use ten grains to the ounce, homatropin and cocaine, four times at intervals of seven or eight minutes, just before going to bed, and then use it every half hour next morning and set my testing hour twelve to fifteen hours from the time I started the cycloplegic. I find I get better relaxation in these young people than by forcing it in an hour or an hour and a half at the office.

The doctor spoke of the disuse of the cross cylinder. In my hands the cross cylinder is the best time saver in my trial case. I use a .12 and a .25 D. cross cylinder.

I would like to emphasize the fact that refraction constitutes a high percentage of all of our work and is something to which we should give a good deal of study. Most good oculists pay too little attention to it.

Dr. J. A. White, Richmond, Va.—I want to call attention to one thing. Why is it we so often find when we have made accurate monocular correction of each eye that the patient can not wear the glasses? Why is it that a cylinder that is absolutely correct for monocular vision is not always correct for binocular vision? A very slight muscle imbalance, not enough for operative correction, is enough to change the rotation of the eye-ball and as a consequence the cylinder given for each eye separately is not at all satisfactory when used for binocular vision. We often have to change the direction of the axis for binocular vision to give satisfaction to the patient. That is due possibly to the effect of some slight muscle imbalance and the rotation of the eye-ball in close work.

Dr. Bahn (closing).—By the best vision lens is meant the one lens combination which, under cycloplegic, positively affords the best possible vision.

In my experience successful refraction depends largely upon the accuracy with which the cylindrical part of refractive error is corrected. Offhand I would say that .25 Diopt. of cylindrical error is capable of producing about the same subjective symptoms as 1. Diopt. of spherical error.

It is advisable to use only one letter of the lowest readable line. The F of the 20/20 line is hardly as legible as the L on the 20/15 line from the same distance. Much time and energy is wasted by the refractionist in struggling with the patient in an effort to have each letter on a given line read. Comparisons are the primary consideration in testing rather than the calling of letters.

Under 40 I believe that the vast majority of patients require a cycloplegic for accurate refraction; over 40 they require a mydriatic for careful fundus examination.

In my experience the routine use of the ophthalmometor hardly justifies the time expended. I remember reading that generally speaking the ophthalmometor affords an approximation of both axis and amount in about one case out of three and of either axis or amount in about two cases in three. I use the instrument only for irregular astigmatism.

Testing with minus cylinders in series has not in my experience been satisfactory, because minus cylinders in series tend to lead the patient into accepting too much cylinder equivalent of the error caused by slightly diminishing the size of the retinal image, as one does with minus cylinders the patient often accepts a cylinder lens which when transposed is too strong and very unpleasant.

For reasons mentioned the cross cylinder has not proven an aid in testing.

I do not believe it is possible to determine with accuracy, in 33 per cent of cases, an exact correction of cylinder axis and amount without a cycloplegic in persons under 40. When in doubt, however, as to the patient's ability to wear the contemplated correction with comfort I have the patient wear the correction in a trial frame about the office for 15 to 30 minutes after the cycloplegic has at least partly worn off.

The Verhoeff charts in my limited experience require more time and energy to obtain satisfactory results than the method discussed.

The glass prescribed is practically always a modification of the best vision lens under cyclo-

plegic adapted to meet the individual patient's needs and comfort.

The scope of this paper and the limited time at our disposal does not permit of a discussion of muscle imbalance.

By obtaining two similar tests at thirty minutes or more intervals, we can feel reasonably sure of obtaining the best vision lens with complete cycloplegia.

It is often advisable to make a binocular test as described, for one eye, especially with very slight cylindrical errors, in which the patient is unable to determine axis inclination accurately.

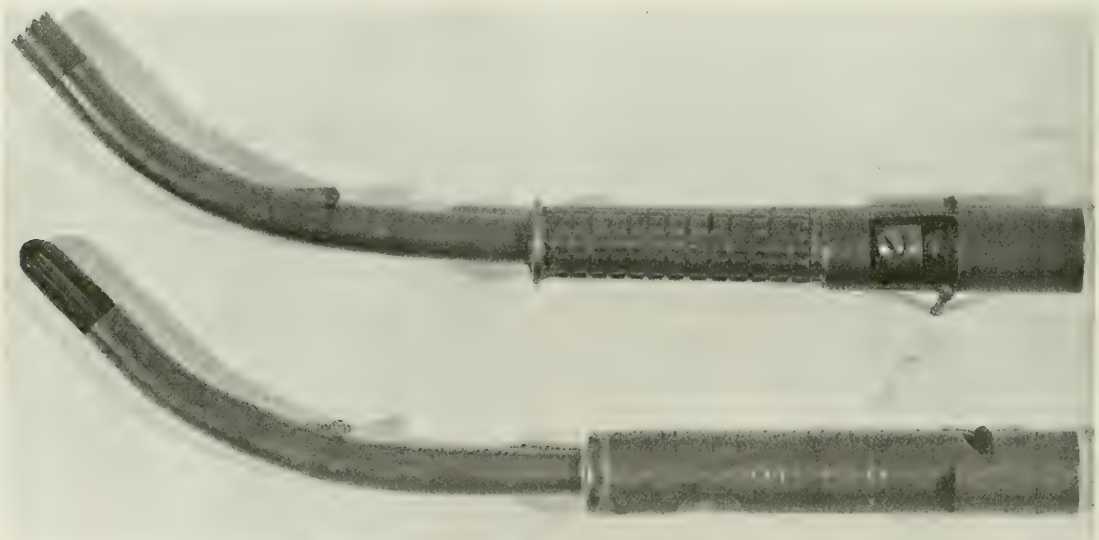
AN ANTRUM OPERATION WITH DEMONSTRATION OF NEW INSTRUMENTS*

By E. L. Roberts, M.D.,
Nashville, Tenn.

The operation covered by this paper is not a new one, for surely enough antrum operations have been devised, but the method of doing it is, in a large measure, new. Neither does the essayist think that the operation in which these instruments can be used to advantage is the only one that should ever be done on the antrum, but it is by far the most common one that is necessary. It will give relief in the great majority of cases. In some cases much more radical procedures are required and in some even less surgery will suffice, though some surgical interference is absolutely necessary.

Suppose it has been decided that the case in hand requires drainage into the inferior meatus for a long period of time, or, it may be, permanently. A local anesthetic of cocaine—I believe 4 per cent is usually strong enough—is used, care being taken not to let too much of the solution run into the throat. The first step is the removal of the anterior fourth or third of the inferior turbinate. I am aware that some operators do not take off the anterior part of the bone at all, but either take out a notch further back or simply fracture the bone near its attachment and elevate it till the opening into the antrum has been made and then bring it back into its normal position and let it heal there. If I make an opening into the antrum so that pus can drain into the inferior meatus of the nose I think it is quite necessary to remove the anterior end of the turbinate. The anterior attachment of this bone is

*Read by title in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.



Top: This instrument is the trephine and is the first one used. The large end is connected with the motor. The trephine strikes the naso-antral wall at an angle of forty-five degrees and thus makes an opening ¼ inch long in the vertical and ⅜ in the horizontal. The trephine is placed in the nose before starting.

Bottom: After making the opening with the trephine, it is disconnected and the reamer attached in the same way. The reamer is placed in the opening and the motor started. The reamer is most useful in enlarging the opening downward where the naso-antral wall is very thick, but can be used to enlarge the opening in any direction.

not horizontal, but oblique or even vertical, and with the antrum wall forms a pocket just in front of the nasal end of the lachrymal duct; so that if this anterior part is not removed, the effort of blowing the nose may carry pus from the inferior meatus into the lachrymal duct or even up into the lachrymal sac, and thus cause serious trouble. Another reason for taking off the anterior portion of the inferior turbinate instead of some other portion of the bone is that you can get at the antrum wall much better and can sometimes see your opening in the wall, a thing that would be impossible if any other portion of the bone were removed.

The next step is the opening through the naso-antral wall. This is made with the trephine, shown herewith, which is run with a dental engine. It could be run with an electric motor. Unless the wall is very much thickened by a suppuration of long standing, the trephine will go through in a surprisingly short time. If the trephine is handled carefully it will usually bring out the piece of bone that it cuts out. If this opening is large enough, your operation is completed and you will wash out the antrum and pack the nose as is your custom. But if the opening is not large enough, as it usually will not be, then pass the reamer in just as you did the trephine and run it till you have made the opening as large as you like. The reamer is especially useful for cutting down the ridge of bone at the floor between the antrum and nose. In each instance the instrument is placed in the nose before the motor is started, and thus all possibility of cutting the anterior nares is avoided.

The advantage that these instruments have over others now in use is that they will make an opening of most any size desired, leave the edges perfectly smooth and not fracture the bone around the opening as all punching instrumets may do.

I had intended at this juncture to demonstrate the use of these instruments by operating upon a cadaver, but as a very recent operation for acute appendicitis prevents my attendance at the meeting, I shall be compelled to forego this part of my subject. At first I had a sharper curve on both instruments, but experience has shown me that the curve as here shown is just about right. Experience has also convinced me that it is easier to make the first opening and to enlarge it afterwards with these instruments than with any other ones I have been able to get.

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THE PELLAGRA SCARE: A GROSS INJUSTICE TO THE SOUTH

The South has suffered much and long from the reputation of being unhealthful. There can be no question that many thousands of the millions who have migrated from the North and Middle West to the North West and to Canada within the last few decades would have come South had it not been for the fear of yellow fever, malaria, hook worm and other tropical diseases. This reputation of being a hot-bed of disease has interfered very materially with the agricultural development of the most fertile lands in the United States, and it has prevented many industries from locating in the favored South.

Yellow fever having been driven forever from the Gulf and Atlantic ports, and malaria and hook worm having been eradicated in some and greatly reduced in the other Southern states, there has been the hope that many white farmers now living on the high priced lands of other sections of the country could be induced to take advantage of the opportunity to buy and cultivate the cheap and fertile lands of the South. There is now the particular need for laborers to take the place of the hundreds of thousands of negroes who were lured from the farms of the South by the high wages in the industrial centers of the North during the war; and plans have been made in many Southern states to advertise in the North and West the opportunities that are open in the agricultural districts of the South with the hope of attracting white farmers from less favored sections of the country.

The hope of inducing white laborers and farmers to come South has been rudely shattered by press dispatches that go to every paper in the United States, and all over the world, to the effect that the South is suffering from famine, and that the starving millions are being attacked by the "plague of pellagra, a disease that results from starvation." The press dispatches also convey the information that Dr. Goldberger, the Moses who is to lead the half starved (?) Southern people out of the wilderness, prophesied that this plague would reappear in the South in the year 1921. The benighted people of the South, who with few exceptions are eating three well balanced meals a day, refused to heed the warnings of the prophet, and the appeal was made to the great Father at Washington, who sent out the edict that the multitudes in the South, even though they do not believe they are in the midst of famine and plague, must be saved by a paternal government.

UNFAVORABLE ADVERTISING FOR THE SOUTH

There can be no doubt of the sincerity of President Harding in his desire to help the South. There is also no question that Surgeon-General Cumming, who is a Virginian of the highest type, is honest in his efforts to prevent the spread of pel-

lagra in the South. Surgeon-General Cumming is a very able man and a highly efficient executive; but he, like many other good men in the medical profession, has been misled by the enthusiasm of Goldberger. General Cumming has been too busy to make a careful investigation of the crude experiments of Goldberger and has accepted the half baked pronouncement that pellagra is due solely to an unbalanced diet. No one doubts Goldberger's honesty of purpose, even though many do not accept his conclusions regarding the etiology of pellagra. Therefore, all those who have been responsible for the slander that the South is famine and plague stricken have been sincere, but it will take years to undo the harm that the Southern states have suffered from such unfavorable advertising.

The vigorous denial by the Southern health officers that famine exists and that pellagra is increasing, or that it is prevalent to an alarming extent anywhere in the South will help to dispel the slander, but there should be a systematic effort to give to other sections of the country the facts regarding the health conditions in the South. If the good people in the North and West knew that there are less than 10,000 cases of pellagra among the 35,000,000 people living in an area of more than 1,000,000 square miles they would realize that pellagra is a comparatively rare disease in the South. If they knew that there is not the slightest chance for another epidemic of yellow fever in any Gulf port, and that malaria and hook worm are negligible diseases in all but a few localities in the South, and that the death rates of the whites in the South are lower than the white death rates in the North, many of them would move their families to the South where cheap lands, fertile soil and balmy climate offer the greatest advantages to the farmer. If these facts were known in New England the cotton mills would come to the cotton fields, and if they were known in other sections of the country our mineral and other industrial resources would be developed in a way that would amaze the world.

THE SOUTH'S OPPORTUNITY

It is to be hoped that the good which is said to come out of evil will in this case result in the well directed effort to teach the people of other sections of the country that men, women and children can enjoy as good health, and do more work and make more money, in the balmy climate of the South than they can in any other section of the country. General Gorgas proved in Cuba and on the Canal Zone that the white man can live and accomplish as much in the tropics as in colder climates. He predicted that with the elimination of tropical diseases the future centers of industry and population would move to the tropics. Agricultural and industrial development must first come to the temperate zone and these and many blessings will come to the South when the living conditions here are known to the millions now living in less favored climates.

Another lesson that may be learned from the good intentions of misguided men is that we should "keep our house in order." Goldberger's propaganda will be helpful to the South if our health authorities can be made to realize that malnutrition is the great predisposing cause of many diseases, including pellagra and tuberculosis. A campaign of education for every family to own a milch cow and have a garden will help reduce the death rate. The people of the South should also continue the fight on malaria and hook worm until they have been entirely eradicated.

This unfavorable advertising should also make physicians realize the importance of reporting the deaths, births and diseases that occur in their practice. When all the Southern states are in the "regis-

tration area," when no one can doubt our vital and mortuary statistics, it will be a long step toward overcoming the deep rooted conviction in the minds of the people of the North and West that the South is unhealthful. The progress of public health work in the South during the past two decades has been wonderful. Our health authorities deserve and should continue to receive the cooperation of the public in the great constructive work that they are doing for the upbuilding of the South.

THE ETIOLOGY OF PELLAGRA

The recent unfavorable advertising that the South has had, occasioned by the belief on the part of some that pellagra is due solely to a deficiency diet, and that because the price of cotton is low there must be general starvation, and therefore an increase of pellagra in the Southern states, makes it appear timely to discuss the etiology of this important disease. Since pellagra was first described, perhaps because the gastro-intestinal symptoms are usually pronounced, foods of one kind or another, or the lack of various constituents in food, have been considered as the most probable etiological factors.

The Italians having had a large experience with pellagra have contributed most to the literature on the subject. Lombroso's theory that it is due to some unknown factor in maize is still regarded by the Italians as the most probable cause. Coni's view that pellagra is caused by a toxin generated in an aspergillum that grows on maize that has not been dried thoroughly, is believed by some. In 1914 Alessandrini[1] promulgated the theory that pellagra results from a deficiency diet, silicon being the constituent which he believed to be absent in the food of pellagrins. Sambon's simulium reptans theory is not accepted by many Italians.

In the United States investigations have been made that led to a marked divergence of opinion regarding the pathogenesis of pellagra. The Thompson-McFadden Commission, headed by Siler, after very thorough studies became convinced that pellagra is due to some infection connected with sewage, and in a number of localities after improvements in the sewerage the disease decreased or disappeared. The late Isadore Dyer, Dean of Tulane Medical School, New Orleans, had the conviction that sewage disposal had something to do with pellagra. He often made the statement that he had "never seen a case of pellagra which developed in a city that was well sewered."

Francis,[2] and his associates in the U. S. Public Health Service, made some thorough studies in the effort to transmit pellagra to monkeys and human beings; and they came to the conclusion that pellagra cannot be transmitted directly from one person to another.

GOLDBERGER'S THEORY

In 1908 Deeks,[3] on the Canal Zone, announced his belief that pellagra is a nutritional disease resulting from a diet excessive in cane sugar and other carbohydrates. In 1914 Goldberger,[4] of the U. S. Public Health Service, made some experiments on Mississippi convicts who developed pellagra, or at least symptoms closely akin to the disease, after having been fed on a low protein, and an excessive carbohydrate, diet. He then announced that pellagra is due to an "unbalanced" diet. Due to very clever propaganda Goldberger's theory has been accepted by many physicians. Many others, however, both before and after Goldberger's theory was announced, believed that malnutrition is an important predisposing factor in the production of pellagra, as it is in tuberculosis; and that the primary cause is prob-

ably a gastro-intestinal infection of some kind.[5]

Since so much has been said about Goldberger's experiments, which by the way have not been verified by others, they should be repeated by an expert on nutrition like MacCollum, collaborating with bacteriologists and epidemiologists to prevent possible infection. It has been pointed out by those who do not believe in Goldberger's theory that his experiments were carried out in the state in which pellagra was most prevalent; and that those on whom the experiments were made may have been infected by some organism in the food, or the infection may have been carried by an insect. They therefore believe that before Goldberger's theory is accepted his experiments should be carried out during the winter months in Maine or North Dakota or in some other state in which there is no pellagra.

Seale Harris,[6] following an investigation of food conditions and nutritional diseases in Europe during and after the World War, called attention to the fact that millions of people in Germany, Belgium and France were half starved, having lived for years on an unbalanced diet, low in proteins and in butter fats, yet pellagra does not exist in those countries. Tuberculosis, scurvy and other diseases, in which a deficiency diet is an important predisposing etiological factor, had increased; but it seemed that the infection, or something besides a deficiency diet, was not present in those countries, or there would have been many cases of pellagra.

SUGGESTIONS FOR INVESTIGATIONS

Since a large proportion of the physicians who have had most experience with pellagra are convinced that the cause is yet to be discovered, it would seem that now is the time to make further investigations regarding the etiology of this puzzling disease.

The fact that pellagra is endemic in countries in which malaria and other tropical diseases exist and the further fact that it is most prevalent during the same seasons have suggested to some that an insect may transmit the infection from one human being to another; and it would seem worth while to make further studies of mosquitoes and other insects that exist in the localities in which pellagra occurs.

The similarity of pellagra and syphilis have been noted since the former was first described. The fact that the use of arsphenamin, and other arsenical preparations, and other drugs that have proved helpful in luetic therapy, have also been reported as successful in treating pellagra, is suggestive. Syphilis is due to a spirochete which was discovered with the use of the darkfield microscope. Recently a leptospira was proved to be the etiological factor in infectious jaundice, and Noguchi,[7] using the darkfield microscope, discovered a leptospospira which apparently is the cause of yellow fever. It is possible that pellagra may be due to an organism which may be discovered by studying the blood, tissues and excretions of pellagrins, with the darkfield microscope.

Major General Sir John Rose Bradford and Captain Wilson,[8] of the British Medical Service, investigated a number of diseases which have been thought to be caused by the filterable virus group of organisms. Using the Noguchi method, they discovered an organism which they believe to be the cause of acute infective polyneuritis. Working along the same lines they isolated organisms from the blood in trench fever, influenza, trench nephritis, mumps, measles, and typhus fever. These organisms will all pass through the Berkfeld filter but they present certain cultural characteristics which were distinct and definite in a number of experiments. Investigations of the blood

and feces of pellagrins, following the methods of Bradford and Wilson, on the assumption that it might be due to a filterable virus, may give positive results.

The South has borne the stigma of having more pellagra than other sections of the country long enough. We have as able and as well trained medical men in the South as there are in the world; and if pellagra is due to an infection of some kind, it is to be hoped that some good Southern doctor will discover it. If so, it will be another great contribution to the science of medicine from a section of the United States that has given to the world the discovery of anesthesia (Crawford W. Long), the boon of pelvic and abdominal surgery (Sims, McDowell, Battey), the proof of the mosquito transmission of yellow fever (Walter Reed, Carter, Gorgas), and other discoveries that have saved hundreds of thousands of human lives.

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6. Seale Harris: Food Conditions in Europe; with remarks on the etiology of Pellagra, New Orleans Medical and Surgical Journal, February, 1920. Vol. 72, No. 8.
7. Southern Medical Journal, Editorial, p. 169, Vol. XII, No. 3, March, 1919.
8. *London Lancet*, 1919.

A STANDARD TREATMENT FOR EARLY SYPHILIS*

It has been the experience of everyone engaged in the treatment of syphilis that patients have presented themselves with the history of having taken a slipshod indeterminate round of therapy with little record of what was done. Often no exact notes were kept of the dosage or duration of treatment. It is also observed that a patient drifting from one doctor to another (as venereal disease cases are wont to do) has had the same treatment repeated over and over again, without a due mixture of the several remedial drugs commonly used as anti-syphilitics.

The need, therefore, becomes apparent that each physician undertaking such work should have some definite objective and should use a more or less routine procedure in early syphilis provided the case is an average one, has not had previous therapy and presents no especial complications or contraindications.

If we are to believe our patients (and many of them unintentionally confuse the facts) some have been diagnosed only clinically with no attempt at confirmation by laboratory tests; some have been given from one to six administrations of arsphenamin and pronounced cured; others have had that much arsenic and then intermittent mixed treatment over a variable length of time. In the end the physician would be unable to say what amount of drugs had been given or whether any two cases had each received an approximate equivalent of therapy.

The significance of a positive or negative Wassermann report is much too broad and intricate a problem to attempt to solve here. But in brief it should be remembered that one positive (even a "four plus") Wassermann should not stamp a patient syphilitic and indicate the immediate institution of treatment any more than an x-ray shadow of a urinary calculus would indicate operation without a second confirmatory plate. On the other hand, we have all seen cases consistently

giving negative Wassermann tests which we knew were syphilis, and obtained desired results from antiluetic treatment. Those of us who can recall the days before Wassermann and Ehrlich made their memorable contributions, know that many cases of undoubted syphilis were unquestionably cured by mercury and iodids alone. Yet there are few who would underrate the value of the serological test for syphilis, or who would not acknowledge the debt that mankind owes for the introduction of arsphenamin (salvarsan) into syphilology.

In this issue of the JOURNAL is an article by Dr. George Walker, of Baltimore, on "A Proposed Standard Treatment for Early Syphilis,"* which because of its highly practical nature should prove a great help to those wishing a general guide to the treatment of syphilis.

Dr. Walker was for some time in charge of the Urological Section of the American Expeditionary Forces in Tours. He has formulated a scheme embodying what he considers the best practice employed in the various armies in France as well as in the systems in use by the leading syphilologists in America.

The JOURNAL cannot too heartily endorse and commend the adoption of this general plan of early-stage treatment as offering a definite mode of attack upon one of the world's most formidable and obstinate diseases. It would not be a bad idea for physicians to make copies of Dr. Walker's chart, or a modified schedule, and attach them to their case histories, writing the date after each treatment on the outline as given.

*Walker, George: "A Proposed Standard Treatment for Early Syphilis," page 683 of this issue.

DIURETICS

"The Right and Wrong Use of Diuretics" is the subject of Dr. Henry A. Christian's article appearing in the May number of *The Medical Clinics of North America,* and such discussions are of extreme importance. The essential function of the kidney is the extraction and elimination of waste products from the body. The kidney has a rich blood supply, so that waste products are extracted from the blood in the capillary tufts of the glomeruli by filtration, and according to Cushny some of these substances are reabsorbed from the peritubular capillary system back into the blood. Hence, in the last analysis the composition of the urine represents the balance between the glomerular filtration and tubular reabsorption. Some substances, such as urea, called non-threshold substances, after filtration from glomerular capillaries are not reabsorbed, while others, known as threshold substances, are partially reabsorbed by the tubular epithelium; glucose is practically completely reabsorbed, but sodium chlorid only partially.

Diuretics cause diuresis either by increasing the amount of fluids or solids, or both. Diuretics to be effective must accomplish this end, for they are given to eliminate deleterious substances from the body, such as the accumulation of edema, the nitrogenous compounds, sodium chlorid, and the hypothetical toxic substances commonly associated with the manifestation of uremia. If the diuretics are not producing diuresis we are not justified in continuing the use of them, for certainly they are not benefiting the patient, and they may be producing harm.

The increase in output of any urinary constituent is usually associated with corresponding water increase. Therefore, Christian believes that the water output is a very satisfactory index of a diuresis.

"Weighing the patient and measuring the amount of urine in relation to fluid intake becomes the best and at the same time the simplest means of determining a diuresis." Water excreted in increased amounts carries with it increased amounts of urinary solids, and in this sense water is a diuretic. Water increases renal work, and when given to a patient or an animal with damaged or diseased kidneys, may cause renal fatigue and frequently a decreased renal output, with edema accumulation in the tissues.

INDICATIONS FOR THE USE OF DIURETICS

The commonly accepted indication for a diuretic is the presence of edema. In edema the kidney and other water eliminating viscera cannot dispose of the fluids already present, therefore water is not a proper diuretic for such patients, and the fluid intake should be restricted. Caffein, theobromin sodiosalicylate, and theophyllin are proper diuretics to remove edema, and one or the other should be used for this purpose. If after a fair trial, diuresis is not produced, or diuresis is not sufficient, the dose of the drug should not be increased, but rather change the diuretic. It should be remembered that diuretics increase renal work, and so may produce renal fatigue, therefore Christian advises intermittent use of diuretics, given one day, and omitted the next. These diuretics are more effective in edema of cardiac origin than in renal edema, so in the latter other measures should also be employed.

In renal edema, "diuretics are often used to the damage of the patient, and when pushed may greatly depress renal function." Digitalis does not increase the urinary output in renal edema, unless there is associated a cardiac decompensation, when digitalis, administered separately for the heart, and diuretics for the edema, will prove very beneficial. The digitalis should not be used in combination with diuretics, but should be given separately.

UREMIA

In uremia, water is the most effective diuretic, because it eliminates from the blood the hypothetical toxic substances. Water should be given by mouth, by rectum, intravenously, and subcutaneously. If water fails to increase urine flow, the edema accumulating in tissues will remove toxins from the blood just the same, where they will do little harm, as has been observed clinically. Water is most effective when it can be given by mouth. In uremia the kidneys are damaged, and so diuretics should be given cautiously.

Sodium chlorid is another injurious substance we seek to eliminate. Its retention is often associated with marked edema. Water therefore is of little use in its removal. It has been recently claimed that salt retention may be an important factor in increasing the blood pressure, in which cases there is no edema, a form of dry salt retention. In sodium cholrid retention with edema diuretics rarely cause diuresis, and therefore rarely increase salt and water elimination. The best way to eliminate the retained salt is by limiting salt intake. Caffein, theobromin and theophyllin should be tried; but if proved ineffectual they should be discontinued.

Retention of nitrogenous substances may result from severely injured kidney, and diuretics are not effective, with the exception of water. The nitrogenous substances may not be toxic in themselves, but retention is an index of the badly damaged kidney function. Estimation of increased nitrogen retention in blood serves as an indication for better renal function. Here as in other conditions discussed, diuretics are only one means of increasing elimination, and all other channels must be employed as well.

REST, BATHS AND POST GRADUATE INSTRUCTION AT HOT SPRINGS

The progressive physicians of the South, who are in a position to enjoy a week of needed rest and the rejuvenation from the wonderful baths at Hot Springs, while at the same time receiving the benefits of four days of post graduate instruction in medicine, are already planning to attend the November meeting of the Southern Medical Association. Not only that, many of them are planning to take their wives, who share with them the hardships and responsibilities of the practice of medicine, and who also need the rest and diversion that can come only from a trip to America's greatest watering place.

As Atlantic City is the ideal meeting place for the North and East, so Hot Springs is for the South and Southwest. Comfortable hotel facilities is the most important consideration for a large medical meeting and those who go to Hot Springs may be assured that they will be taken care of comfortably. One hotel is reserving space for 800 doctors and there are many other first class hotels that altogether can care for several thousand guests.

DOCTORS TO TAKE THEIR WIVES TO HOT SPRINGS

The medical profession of Hot Springs has made many plans for the comfort and entertainment of the members of the Southern Medical Association. Among the courtesies that will be extended to visiting doctors and their wives is a course of free baths in some of the finest bath houses in the world. The Hot Springs doctors state that a week of baths in the hot mineral waters of their resort will add years to the lives of the doctors and their wives who have the good judgment to visit the Ozark Mountains in November. They may be "good promisers"; but certainly there could be nothing more profitable from the view point of health and professional efficiency, for the overworked doctor and his wife than a "honeymoon" trip to the wonderful resort of the South West.

Dr. Frank A. Jones, of Memphis, writes that he intends to take his wife for a week of rest, baths and delightful association with Southern doctors; and he advises every other doctor in the South to do likewise. The Secretary-Editor intends to follow Dr. Jones' advice by taking his wife and daughter for a week's stay in Hot Springs; and he heartily concurs in the opinion that the doctors who are so fortunate as to be married should share with their wives the pleasures of the meetings of the Southern Medical Association.

BENEFITS DERIVED FROM ATTENDING MEDICAL MEETING

The rest, baths and pleasure of the Hot Springs meeting of course add to its attractions, but they are incidental to the best possible post-graduate instruction that will be crowded into the four days given over to the scientific sessions of the Southern Medical Association. The physician in any line of work will hear those best prepared discuss the live medical, surgical and public health topics in which he is interested. No member of the Southern Medical Association ever attended a meeting without going home better prepared to practice his profession.

The benefits derived from attending medical meetings come not only from what one learns and from the pleasures

of association with others in the same profession and with whom there is no conflict of interest, it actually "pays in dollars and cents" for a doctor to attend them. His patrons and the public generally feel that the doctor who is sufficiently interested in his profession to attend medical meetings is the one who is best prepared to treat the sick. Usually the estimation of a physician by the public is correct, and it is a fact that the physicians who attend medical meetings are usually the progressive and successful members of the medical profession. Certainly the leading medical men in the South are among those most interested in the Southern Medical Association.

REDUCED RAILROAD RATES

After four years without railroad rates to medical meetings, and particularly since the raise in passenger fares, it will be a relief to know that a special rate has been granted to the members of the Southern Medical Association who go to Hot Springs. In order to secure this rate for themselves and other members of their families, physicians buying round trip tickets to Hot Springs must present to their local railroad agents identification certificates issued by the Southern Medical Association. The Business Manager will gladly send the proper certificate to any physician who desires to go to Hot Springs.

With reduced railroad rates, with the entertainment and attractions of Hot Springs, and with the wonderful programs that have been arranged by the officers of the sixteen scientific sections of the Southern Medical Association, the November meeting should be one of the largest and one of the most successful gatherings of medical men ever held in the South.

The Hot Springs Meeting

HOT SPRINGS AS A HEALTH AND PLEASURE RESORT*

By Walter J. Hebert,
Hot Springs, Ark.

"There have always been waters to which men and women repaired to recuperate from the strain of living, and these places have invariably become the resorts of fashion. All down the ages comes testimony that waters gushing from the bosom of Mother Earth are efficacious in relieving the ills to which flesh is heir. But of all the world's beneficent waters there are none to compare with the Hot Springs of Arkansas. 'Their fame has filled the seven climes.' They are absolutely unparalleled in hygienic qualities. The testimony to their curative and restorative powers is overwhelming both in extent and character."

Such are the words of one writer in telling of Hot Springs National Park, and words more applicable to the little city nestled among the Southern Ozarks could not have been written by the hand of man. The great American Spa is sometimes called "the Carlsbad of America." Its Magnolia Promenade is another Champs-Elysees, where people from all parts of the world rub shoulders and pass joyously on their way, and there is no disputing the fact that its waters have no equal.

Business District of Hot Springs

The great curative value of the Hot Springs waters is attributed to radio-activity. It was the Interior Department of the United States Government that employed Professor Bertram B. Boltwood, of Yale College, to make a test of the springs here and this renowned authority on radium reached the following conclusion:

"The waters of the Arkansas Hot Springs are radio-active to a marked degree. The radio activity of the waters is due to dissolved radium emanuation (a gas)."

Probably no city of its size on earth has as many reputable physicians as Hot Springs. There are about 175 members of the medical profession here who have registered with the government and are actively engaged in the practice of medicine. The far greater number of this body of physicians are affiliated with the Southern Medical Association and other medical societies. They have secured the 1921 convention of the Southern

*From the Sub-Committee on Publicity of the General Committee from the Hot Springs profession.

Medical Association for Hot Springs and now feel satisfied that many dubious doctors in all parts of the South will be convinced of the wonders of this resort if they but attend this year's meeting.

But to revert to the quotation used at the beginning of this article and consider Hot Springs as the "resort of fashion" and the playground of America. Thousands of prominent men and women, the aristocracy of the United States, come here every year and also thousands of the "common people" visit the "Vale of Vapors." The distinction of class arises in the midst of this great throng of visitors the same as it does in other parts of this country, which theoretically has no class distinction, and the fashionable and social life is built up around the large hotels.

Dances, dinners, musicals, and other entertainments are arranged at these typical resort hotels and never a week passes without some special function being held that attracts both visiting and local society. Horseback riding and golfing are the favorite outdoor sports among the higher social set and many happy hours are whiled away on the winding mountain highways and the picturesque golf links.

An idea of the many prominent people that visit this city might be obtained by quoting this interesting excerpt from the annual report of the secretary of the Hot Springs Business Men's League:

"Many notables and characters of national prominence were guests of Hot Springs during the year (June, 1920, to June, 1921), among the number being: Governor Robertson, of Oklahoma; United States Senators Robinson and Caraway, of Arkansas; Attorney General Brundige, of Illinois; William Jennings Bryan and wife; United States Senator Watson, of Indiana; Ex-Congressman Thomas B. McKeewn, of Oklahoma; Mr. Williams, General Superintendent of the Illinois Central Railroad; Hon. Charles F. Murphy, Tammany Hall leader, New York City; Senator J. T. McCall, of New York; Albert Schulties, President Chamber of Commerce of Washington, D. C.; B. F. Bush, President Missouri Pacific Railroad; Senator George W. Smith, of New Jersey; United States Senator Jones, of New Mexico; Mr. Anderson, President Georgia and Florida Railroad; Ex-Governor Lowden, of Illinois; Hon. C. H. Brown, ex-Senator from New Jersey; J. W. McClelland, famous turfman; Albert W. Hall, playwright; Winchell Smith, author; Blanche Sweet and Harry Rich, legitimate stage stars; Donald McGregor, the Scottish Giant; Alma Gluck, Ben Turpin, and many others."

It is little wonder that so many prominent men and women come to Hot Springs, because even though its waters disappeared, its ideal climate, imposing mountains, and pine scented breezes would continue to make it one of the most pleasant spots in the whole wide world.

REDUCED RAILROAD RATES TO THE HOT SPRINGS MEETING

Special reduced round trip rates on all railroads have been granted the Southern Medical Association for doctors attending their Hot Springs meeting. This is on the Indentification Certificate plan, the Certificates to be issued from the Association office at Birmingham upon request. All doctors contemplating attending the Hot Springs meeting must procure an Identification Certificate if they wish to get the benefit of this special rate. Be sure to apply for Certificate early so as to avoid confusion at the last minute. The rate is one and one-half fare for the round trip, tickets on sale November 10-16, return limit November 21.

MUCH INTEREST SHOWN IN THE GEORGIA STATE MEDICAL SPECIAL TRAIN FROM ATLANTA TO HOT SPRINGS

Numerous inquiries are being received by Dr. Allen H. Bunce, Secretary Medical Association of Georgia, and Mr. Pat B. Hampton, D.P.A., Seaboard Air Line Railway, regarding the special train which will be operated by the Medical Association of Georgia, to Hot Springs, Arkansas, for the meeting of the Southern Medical Association, Nov. 14-17, as announced in the August issue of the JOURNAL. This train, which will consist of all steel Pullman drawing room sleeping cars, compartment cars and dining car, will leave Atlanta via the Seaboard Air Line Railway, at 5:30 P. M., Saturday, Nov. 12, going via Birmingham, Frisco Railroad to Memphis, thence by the Rock Island Railroad to Hot Springs, arriving there Sunday afternoon, Nov. 13.

All the physicians of the Southeastern States, together with their families, who anticipate attending the Southern Medical Association meeting, are cordially invited by the Medical Association of Georgia to join them on their special train. Requests for information or Pullman reservations should be addressed to Mr. Pat B. Hampton, District Passenger Agent, Seaboard Air Line Railway, Atlanta, Ga., or Dr. Allen H. Bunce, Secretary Medical Association of Georgia, Healy Building, Atlanta, Ga.

Correspondence

THE EDUCATIONAL PREPARATION FOR MEDICINE

Editor, SOUTHERN MEDICAL JOURNAL:

In the August issue you have made an error in my discussion of Dr. Wilson's paper, "The Educational Preparation for Medicine." In the first paragraph of my discussion, the last part of next to the last sentence of that paragraph, page 644, reads, "And that of the graduates during the same period of a much older famous school only 2 per cent are in active practice." It should read, "26 per cent." Please make correction in your next issue.

TOM A. WILLIAMS, M.B., C.M.
WASHINGTON, D. C., August 2, 1921.

Book Reviews

A Study in the Epidemiology of Tuberculosis with Especial Reference to Tuberculosis of the Tropics and the Negro Race. By George E. Bushnell Ph.D., M.D., Colonel, U. S. Army (Medical Corps), Retired; Honorary Vice-President and Director, National Tuberculosis Association of the United States; Member American Climatological and Clinical Association. New York: William Wood & Co., 1920.

The author has written a valuable book which should be widely read, as he gives data that disproves many generally accepted ideas.

The manner in which he contrasts tuberculosis in the civilized and uncivilized races is very instructive and although not original is very ably presented. The section of the book dealing with tuberculosis in the negro in the United States is of especial interest to all Southern physicians, where he shows that the negro is more frequently a sufferer from active tuberculosis, not because of any racial predisposition, but due to his manner of living, poverty and intemperance.

The data on this section and the American Indian are most illuminating.

The section in relation to the diagnosis of tuberculosis with especial reference to the use of tuberculin is a very valuable article for any one interested in the epidemiological study of tuberculosis.

Colonel Bushnell's section on some practical considerations of this subject is of real value and should be read by all those having the care of children intrusted to them.

It is seldom that one has the pleasure of reading in review a book which is of the standard of this one by Colonel Bushnell.

Pathogenic Microorganisms, a Practical Manual for Students, Physicians and Health Officers. By William Hallock Park, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College, and Director of the Bureau of Laboratories of the Department of Health, New York City; and Anna Wessels Williams, M.D., Assistant Director of the Bureau of Laboratories of the Department of Health, Consulting Pathologist to the New York Infirmary for Women and Children; assisted by Charles Krumwiede, Jr., M.D., Assistant Director of the Bureau of Laboratories; Assistant Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College, New York City. Seventh edition, enlarged and thoroughly revised, with 786 pages, 214 engravings and 9 full-page plates. Philadelphia and New York: Lea & Febiger, 1920.

This is a seventh edition of an always useful book, to which much new material has been added. Particularly the chapter on media has been practically rewritten to show the importance of the recently promulgated theories of hydrogenion concentration, which have thrown a new light upon bacterial studies. There are other changes and improvements which bring the work thoroughly abreast of the times.

The Wassermann Test. By Chas. F. Craig, M.D., M.A., F.A.C.S., Lieutenant-Colonel, M.C., U. S. A.; Professor of Bacteriology, Parasitology and Preventive Medicine, and Director of Laboratories, Army Medical School, Washington, D. C.; formerly Curator, Army Medical Museum, and Commanding Officer Yale Army Laboratory School. 279 pages. Illustrated. Second edition. Revised and enlarged. St. Louis: C. V. Mosby Co., 1921.

The introduction is a discussion of bacteriolysis and hemolysis together with a history of the Wassermann reaction.

Chapter IV on preparation of reagents is incomplete in that the preparation of the cell suspension is not clear and hence would be misleading to a beginner.

Instead of the usual one, two, three and four plus, a minus, plus minus, one plus, and two plus, reading is advised. This complicates an already complicated reading.

The method used at the Hygienic Laboratory is described and the reviewer thinks it a little heavy. On page 126, under titration of antigen, the writer speaks of the antigen's combining with complement. We have been under the impression that an antigen unites with its specific amboceptor and that the complement was later deviated or fixed. Hence the complement deviation or fixation test.

A chapter devoted to the spinal fluid is good with the exception that it is suggested that not more than 5 c. c. of spinal fluid be withdrawn for the test. This amount it seems to us, is insufficient for a satisfactory examination.

A Text-Book of Dermatology. By J. Darier, Physician to the Hospital Saint-Louis, Member of the Academy of Medicine, Paris, France; Honorary Member of the American Dermatological Association, etc. Authorized translation from the second French edition. Edited with notes by S. Pollitzer, New York, ex-President of the American Dermatological Association; Corresponding Member of the French Society of Dermatology and Syphilography, etc. 769 pages; 204 engravings and 4 colored plates. Philadelphia and New York: Lea & Febiger, 1920.

We commend translations which bring before the American profession in an easily available form works of the best foreign scientists. The second edition of this book was written to supply the needs of French doctors and soldiers returning from the war. It has been brought up to date and many of its chapters have been rewritten and elaborated. The sero-diagnosis of syphilis and treatment with arsenobenzols has been given considerable space. The first edition was criticised by the noted dermatologist, Professor Jadassohn, of Berne, and his suggestions were incorporated in the body of the second edition. Dr. Pollitzer, in editing it, has added comments and corrections which enhance the value of the text. This is one of the best books on dermatology which has been printed in the English language.

Pulmonary Tuberculosis with Case Histories. By Edward O. Otis, A.B., M.D., Professor of Pulmonary Diseases and Climatology, Tufts College Medical School, Boston; formerly Visiting and Consultant Physician, Massachusetts State Sanitarium (Rutland); Fellow and former President, American Climatological and Clinical Association; Corresponding Member, International Tuberculosis Institute; Consulting Physician to the Boston Dispensary, Tuberculosis Department; Major M.R.C., U.S.A. Boston: W. M. Leonard, 1920.

The book is written for the general practitioner and is a safe guide to follow. Certain sections are much better than others. For example, the sections on pathology and bacteriology are not up to the standard of the rest of the book.

The author lays too much stress upon the question of inheritance of a lowered resistance to tuberculosis, which is by no means the accepted view.

The case histories as a whole are well chosen and most of the diagnoses are justified by the data he presents.

The sections on Diagnosis, Prognosis and Treatment are good and should prove a safe guide.

Taken as a whole, the book will serve a useful purpose. Moreover, it is well printed and free from typographical errors.

Text-Book of Biology, for Students in General, Medical and Technical Courses. By William Martin Smallwood, Ph. D. (Harvard), Professor of Comparative Anatomy in the Liberal Arts College of Syracuse University. Fourth Edition, Thoroughly Revised. Illustrated with 229 Engravings and 3 Plates in Colors; 398 pages. Philadelphia and New York: Lea and Febiger, 1920.

This fourth edition is of course revised and up-to-date. Beginning with the historical development of biology, Dr. Smallwood approaches and describes the theories of modern times. He discusses cells and unicellular organisms generally, describing the biology of the frog, paramoecium, pleurococcus, yeast, lower plant types, crayfish, insects, and he discusses general considerations of variation, heredity, and evolution. It is a very good brief text-book.

Epidemic Encephalitis (Encephalitis Lethargica). By Frederick Tilney, M.D., Ph.D., Professor of Neurology, Columbia University; Attending Neurologist, Presbyterian Hospital and the New York Neurological Institute; Consulting Neurologist, Roosevelt Hospital, New York; and Hubert S. Howe, A.M., M.D., Instructor in Neurology, Columbia University; Assistant Neurologist, Presbyterian Hospital, New York. New York: Paul B. Hoeber, 1921.

This little monograph takes up the subject in such a logical and interesting way that it is a pleasure as well as an advantage for any one to read it. The authors divide the disease into eight clinical types, discuss these with case histories added after each discussion.

They consider that the disease is an acute inflammatory reaction in the tissues of the central nervous system, which will probably eventually be considered as due to a general infection of the whole system.

The book will repay study on the part of any physician and will prove a real addition to the reference works of any doctor.

There is a bibliography of the more recent articles on this disease.

SOUTHERN MEDICAL NEWS
PAGE 38

The Prescribing of BENZYLETS

is constantly, consistently increasing—a positive proof of the inherent value of this non-narcotic antispasmodic-analgesic that takes the place of opium in so many pathologic conditions—dysmenorrhea, asthma, whooping cough, neuritis, hypertension, etc.

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INDIANAPOLIS, Chemists U. S. A.

Epidemic Respiratory Diseases. By Eugene L. Opie, M.D., Colonel, M.R.C., U.S.A.; Professor of Pathology, Washington University School of Medicine; and Francis G. Blake, M.D., Major, M.R.C., U.S.A., Associate Member of the Rockefeller Institute for Medical Research; and James C. Small, M.D., formerly First Lieutenant, M.R.C., U.S.A., Bacteriologist, Philadelphia General Hospital; and Thomas M. Rivers, M.D., formerly First Lieutenant, M.R.C., U.S.A., Associate in Bacteriology, Johns Hopkins University. St. Louis: C. V. Mosby Co., 1921.

This book will long remain a reference for this subject, for it is clearly written and the authors give their data in full, from which they draw their deductions. They conclude that the B. influenzae (Pfeiffer) is the cause of the disease designated "influenza," in which they differ from other observers. The whole book is so well written and the subject so fully covered that it should prove an addition to any library. In fact it is a book which the pathologist and internist should welcome. It is also well printed and free of typographical errors. The illustrations are also well chosen.

Southern Medical News

ALABAMA

Dr. L. T. Lee, Huntsville, has been appointed Director of the Bureau of Epidemiology of the State Department of Health to succeed Dr. J. L. Bowman, who resigned to become Health Officer of the City and County of Montgomery.

Dr. Fred Crenshaw, Fairfield, and Miss Alberta Thomas, Macon, Georgia, were married June 11.

ARKANSAS

Dr. Dewell Gann, Little Rock, has been appointed Chairman of the Organization Committee of the new staff of the City Hospital.

Dr. William C. Minnich and Mrs. Cleo Gregg, Fulton, both of Hot Springs, were married July 28.

Deaths

Dr. Levi Dawson Crawford, Marked Tree, aged 63, died April 6 from angina pectoris.

Dr. James W. McCracken, Sulphur Springs, aged 84, died in April.

Dr. Benjamin Levin Hill, Stuttgart, aged 53, died June 20.

Dr. John W. Patton, Morrilton, aged 53, died May 11.

Dr. V. O. Vandeventor, Harrisburg, died July 19 after an illness of six weeks with Brights disease.

DISTRICT OF COLUMBIA

Dr. Michael E. Gardner, recently appointed Chief of the Contagious Disease Service of the Health Department of the District of Columbia, has resigned.

Dr. Walter J. Pennell, M.C., U. S. Navy, Washington, and Miss Mary E. Eliason, were married at Washington July 6.

Deaths

Dr. Alice Burritt, Washington, aged 67, died at the Homeopathic Hospital, Washington, July 6.

FLORIDA

Dr. J. E. Boyd, Jacksonville, has been designated as Chief Medical Examiner of Unit No. 14 of the Bureau of War Risk Insurance.

The U. S. Public Health Service Hospital, Lake City, which has a capacity of 100 beds, is contemplating an addition which will double the capacity of the Hospital, and will cost $300,000.

The second annual meeting of the Florida Railway Surgeons' Association was held at Pensacola May 9. The following officers were elected: Dr. James H. Pittman, Jacksonville, President; Dr. J. S. Turberville, Century, Vice-President; Dr. E. W. Warren, Palatka, Secretary-Treasurer.

The City Hospital Board, St. Petersburg, has purchased a tract of five acres for the purpose of building a city hospital for negroes. Plans provide for a structure of three wings, which will cost approximately $60,000.00.

Deaths

Dr. Joshua S. Barnes, St. Petersburg, aged 67, died August 4.

(Continued on page 40)

Laboratories of

Drs. Bunce, Landham and Klugh

ATLANTA, GEORGIA

DEPARTMENTS

PATHOLOGY	BACTERIOLOGY and SEROLOGY	X-RAY and RADIUM
Allen H. Bunce, A.B., M.D., F.A.C.P.	George F. Klugh, B.S.,M.D.	Jackson W. Landham, M.D.

These laboratories are equipped for making every test of clinical value in the diagnostic study of medical and surgical cases. Only standardized methods and technique are used.

In addition to the diagnostic study of cases there are adequate facilities for the x-ray and radium treatment of conditions in which these forms of treatment are indicated.

Fee lists and containers for pathological specimens and information in reference to x-ray and radium work furnished upon request.

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Many People Are Fried Into Bad Health With Animal Fats

Animal fats, because of their low smoking point, "decompose" into other than their natural fatty acids and glycerine.

They develop acrolein and other products, irritating to the stomach and intestines.

This favors under-oxydation—especially of the end products of proteid digestion—and stand in loco parentis to a whole hatful of trouble.

Why not avoid all this? Just tell your patient to stop the use of all animal fats in cooking, and use Mazola instead.

Mazola is a pure vegetable oil—already fluidified—and therefore more readily digested than fats that melt only at relatively high temperatures.

Also, Mazola stands a high degree of heat before the smoking point is reached. So it is not nearly so likely to develop acrolein or other oxydation products harmful to the digestive nucosa.

Try this suggestion on a half a dozen of your patients suffering from digestive or under-oxydation troubles, and see how much better they will be in a short time.

Many physicians are also recommending the liberal use of Mazola as a salad oil, to increase heat-energy in patients with malnutrition, or who need a palatable, easily-assimilated, protein-sparing food.

Mazola contains lecithin and from 1 to 1½% of glycerophosphates—immensely valuable in all nervous and wasting disorders. It is a food-tonic of wonderful efficacy, as even a short trial will demonstrate.

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Prompt reports.
Reliable work.
Reasonable prices.

Members of the Medical Profession are invited to visit our laboratories at any time.

DR. GEORGE B. ADAMS
Director.

Continued from page 38

GEORGIA

The Venereal Institute-Clinic, conducted by Emory University, Atlanta,. July 11-16, was attended by more than two hundred physicians of the State. Three hours was devoted each morning to lectures on venereal diseases by professors of Emory University. The entire afternoons were devoted to work in the large clinic and at all the hospitals of the city.

At the recent meeting of the Chattahoochee Valley Medical and Surgical Association held at Warm Springs, the following officers were elected: Dr. Frank K. Boland, Atlanta, President; Dr. Marcus A. Skinner, Selma, Ala., Vice-President; Dr. William J. Love, Opelika, Ala., Secretary-Treasurer, re-elected.

Deaths

Dr. Floyd W. McRae, Atlanta, aged 60, died Aug. 13.

Dr. Ferdinand N. Ware, Thomson, aged 64, died June 20 from paralysis.

Dr. J. R. Dickey, Columbus, aged 36, died recently at Breman.

Dr. Charles O. Smith, Atlanta, aged 55, died suddenly June 30.

Dr. James T. Gibson, West Newton, aged 63, died June 24.

Dr. J. R. Arrington, Gainesville, died July 3.

KENTUCKY

Dr. J. B. Miner, of the research department of the University of Pittsburg, has been appointed head of the psychology department of the University of Kentucky, Louisville.

Dr. V. D. Guittare recently took charge of the health work of Mason County, with headquarters at Maysville.

Dr. R. H. Moss has been elected County Health Officer of Larue County.

Adair County Medical Society has elected the following officers: Dr. W. F. Cartwright, President; Dr. S. P. Miller, Secretary.

Breathitt County Medical Society has elected the following officers: Dr. O. H. Swango, President; Dr. C. H. Hurst, Vice-President; Dr. D. H. Kash, Secretary.

Johnson County Medical Society has elected the following officers: Dr. J. C. Sparks, President; Dr. Grant Rice, Vice-President; Dr. E. E. Archer, Secretary; Dr. J. R. Wells, Treasurer.

Lee County Medical Society has elected the following officers: Dr. G. S. McDonald, President; Dr. J. H. Evans, Vice-President; Dr. A. B. Haskins, Secretary; Dr. Roscoe Pryse, Treasurer.

Owen County Medical Society has elected the following officers: Dr. J. H. Chrisman, President; Dr. J. W. Botts, Vice-President; Dr. K. S. McBee, Secretary-Treasurer.

Scott County Medical Society has elected the following officers: Dr. H. V. Johnson, President; Dr. J. W. Baird, Vice-President; Dr. C. T. Lancaster, Secretary-Treasurer.

Work on the government hospital being built at Dawson Springs is being pushed as fast as possible. There are eight fireproof buildings under construction. The entire unit when completed will include twenty-two buildings.

Dr. J. T. Morris, Stanford, has been made Attendance Officer of Lincoln County. The appointment was made by the City Board of Education.

Deaths

Dr. John Breckenridge Richardson, Louisville, aged 69, died July 3 from myocarditis.

Dr. Richard Burton Robards, Harrodsburg, aged 45, died July 7.

Dr. Green Munroe Cook, Hazard, died July 15.

Dr. Alonzo M. Morrison, Louisville, aged 83, died July 31.

Dr. Reuben Saunders Toombs, Lexington, aged 77, died July 15 after a long illness.

Dr. Charles Robert Wilson, Louisville, died at his home recently.

Dr. James W. Snider, Avoca, died recently at his home.

Dr. Jasper M. Wilson, Pleasure Ridge, aged 89, died recently.

LOUISIANA

The Tri-State Medical Society of Texas, Arkansas and Louisiana, will hold its next meeting at Shreveport, December 7-8.

Dr. William W. Leake, New Orleans, has been elected Superintendent of the Charity Hospital, to succeed Dr. S. W. Stafford, resigned.

Dr. Amedee Granger has been appointed Chief of the x-ray Department of the Charity Hospital, New Orleans.

The East Feliciana Parish Medical Society has elected the following officers: Dr. T. W. Evans, President; Dr. Chas. Miller, Vice-President; Dr. E. M. Toler, Secretary-Treasurer.

(Continued on page 42)

Oak Forest Infirmary
Cook County, Ill.
Showing Equipment for X-Ray Diagnosis

Guarding a Physician's Reputation

MORE precious than money is reputation to the physician. Yet increased income is usually the result of increased reputation in the practice of medicine—which is as it should be.

Reputation is built on *character* and *ability*. It is hard to acquire and easy to lose.

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For these reasons the Victor X-Ray Corporation has set for itself a standard higher than that followed by ordinary business firms who deal only with the general public.

Every piece of Victor apparatus is made, therefore, not simply according to an honest man's business code of honor, but according to the higher code that physicians obey. However new in design, it is a scientifically tested piece of apparatus — as much so as any new serum or anti-toxin. It must function trustworthily — not merely for a time, but during its whole, long, useful life.

To this end the Victor X-Ray Corporation established Service Stations in the principal cities to give physicians technical advice. It is the business of these stations not only to assist in keeping Victor X-Ray apparatus in perfect condition but to co-operate with physicians in every legitimate way.

Victor Service also includes the publication of a periodical called "Service Suggestions" in which X-Ray progress is recorded. Although published primarily for the benefit of Victor clients it will be sent to physicians who wish to learn of the advances that are made from time to time in radiography. There is no charge for "Service Suggestions."

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(Continued from page 40)

The Hotel Dieu Staff has elected the following officers: Dr. Homer Dupuy, President; Dr. H. W. Kostmayer, Vice-President; Dr. H. E. Nelson, Secretary.

Dr. Elizabeth Bass, New Orleans, was elected President of the Medical Women's National Association at the meeting of the A,. M. A. in Boston in June.

Deaths

Dr. William H. Baldwin, Alexandria, aged 50, died July 28 at the Baptist Hospital from appendicitis.

Dr. Louis Favrot Reynaud, Baton Rouge, aged 79, died July 15.

Dr. Elizabeth Cohen, New Orleans, aged 101, died May 28 at the Julius Weis Home from myocarditis.

MARYLAND

A dispensary for the treatment of disabled soldiers and sailors is to be established in Baltimore. Dr. Henry A. Smith, director of the office of the U. S. Public Health Service in Baltimore, will be in charge. The dispensary will be conducted under the United States War Risk Bureau.

Dr. Robert P. Bay, Baltimore, has been appointed Acting Chairman to the Board of Supervisors of City Charities, to succeed Dr. J. Hall Pleasants, resigned.

Dr. John J. Erwin, a member of the staff of Mercy Hospital, Baltimore, has been appointed Superintendent of the Hospital succeeding Dr. Irwin R. Ridgely, resigned.

Dr. Maurice C. Pincoffs has been appointed Professor of Medicine and head of the Department of Medicine in the Medical School of the University of Maryland, Baltimore, succeeding Dr. Gordon Wilson.

Dr. Alan M. Chesney, Baltimore, has been appointed Associate Professor of Medicine at the Johns Hopkins Medical School.

Dr. Wade H. Frost, formerly with the U. S. Public Health Service, has been appointed head of the Department of Epidemiology and Public Health Administration in the School of Hygiene and Public Health of the Johns Hopkins University.

Dr. Martin R. Casey, formerly Assistant Superintendent of the West Virginia State Hospital, of Weston, has been appointed Assistant to Dr. Charles J. Carey, Superintendent of the Eastern Shore State Hospital, Cambridge.

Dr. Walter Dent Wise, Baltimore, and Mrs. Hugh McMillan, Colorado Springs, Colo., were married July 27.

Dr. Charles Reifschneider and Miss Viola L. Barnett, both of Baltimore, were married June 28.

Dr. Francis Xavier Kearney, Baltimore, and Miss Louise A. Joan, Brittany, France, were married in Baltimore June 30.

Deaths

Dr. George Phillip Stallman, Baltimore, aged 45, died June 23 at Irondequoit, N. Y., from drowning.

MISSISSIPPI

Dr. O. G. Coleman, Coffeeville, has been appointed Health Officer for Yalobusha County.

Dr. J. O. Ringold, Winona, has been reappointed Health Officer for Montgomery County.

Dr. Alfred Jamison, Marks, has been appointed County Physician for Quitman County to fill the unexpired term of the late Dr. G. W. Johnson.

Dr. T. H. Smith, Pittsboro, has been appointed Health Officer of Calhoun County.

Dr. Willis Walley, Assistant Superintendent of the State Charity Hospital, Jackson, has resigned in order to give more time to his private practice.

Dr. R. M. Adams, Ripley, has been reappointed County Health Officer for Tippah County for a period of two years.

Dr. M. L. Montgomery, Louisville, has been reappointed Health Officer for Winston County.

Dr. J. A. Toole, Marks, has been reappointed Health Officer for Quitman County.

Dr. W. E. Noblin, Yazoo City, has been reappointed Health Officer for Yazoo County.

Dr. C. N. D. Campbell, Greenwood, has been appointed Health Officer of Leflore County.

Dr. W. R. Parsons, Vicksburg, has been appointed Health Officer of Warren County.

Dr. Victor W. Maxwell, Brookhaven, and Miss Edith Crawford, Laurel, were married on July 28.

Dr. James Edward Furr, Marks, and Miss Jessie May Chrestman, Lyon, were married in July.

Deaths

Dr. Thomas L. Luna, Floyd, aged 66, died July 2.

Dr. William W. Stuart, Clarksdale, aged 86, died June 29.

(Continued on page 44)

For The Surgeon

Bard-Parker Knife

It's Sharp!

Ask Your Dealer

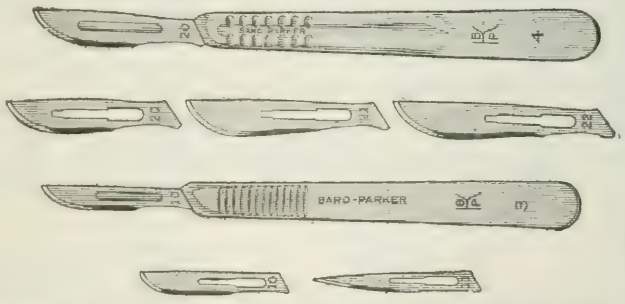
Bard-Parker Company, Inc., New York

It's Sharp!

That is the opinion expressed by all surgeons who have used this

BARD-PARKER KNIFE

Designed to eliminate the nuisance and uncertainty of resharpening by means of renewable blades, which have the sharpest cutting edge attainable.



The price of a new blade is less than the cost of sharpening an ordinary scalpel. The surgeon is thus assured of a knife of standard sharpness, always ready for use. The illustration demonstrates its simplicity, the price its economy.

Blades in packages containing 6 of one size. Order by size number.

Handles, all sizes, each, $1.00.
Blades, all sizes, per dozen, $1.50.
Nos. 1 and 3 Handles fit Nos. 10 and 11 Blades.
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Pocket Cases for 2 Handles and a dozen Blades. Leather Cases, $1.50. Khaki Cases, $1.00.

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Surgical Instruments and Hospital Supplies

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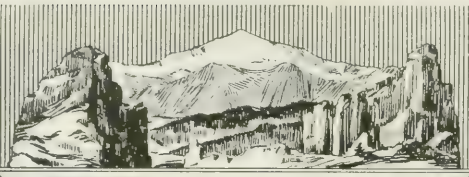

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LONDON
PARIS

(Continued from page 42)

MISSOURI

A new building, three stories high, as an extension to the Medical School is being erected by St. Louis University. The old building is being remodeled in order to give more adequate accommodations to other departments.

The Medical Association of the Southwest and Missouri Valley Medical Association will hold their joint session in Kansas City October 25-28.

City architects of St. Louis are preparing plans for the proposed new building of the Municipal Hospital Farm which will cost approximately $600,000.

The Calloway County Hospital at Fulton was recently opened.

The addition to St. Francis Hospital, Maryville, has been completed. The cost of the building is $165,000.

Dr. C. H. Shutt, Assistant Health Commissioner of St. Louis, has resigned and has been succeeded by Dr. G. A. Jordan.

Dr. I. D. Krauss, of the U. S. Public Health Service Hospital at St. Louis, has been appointed Director of the Bureau of Child Hygiene of the State Board of Health.

The Anesthetists of the Middle West will hold an Organization Meeting in Kansas City October 24-28, in conjunction with the meetings of the Medical Veterans of the World War, Missouri Valley Medical Association, Medical Society of the Southwest and National Anesthesia Research Society.

Dr. William Conrad G. Henske, St. Louis, and Miss Margaret Yates, Chippewa Falls, Wis., were married in Kansas City June 15.

Dr. George Herrman, St. Louis, and Miss Anna Williams, Vandalia, Ill., were married June 30.

Deaths

Dr. Theodore R. Dodsley, St. Louis, aged 44, died July 18 from sleeping sickness.

Dr. William Lampkin, Jefferson City, aged 72, died July 28 following a long illness.

Dr. Lucien Claude McElwee, St. Louis, aged 59, died July 3.

Dr. Albert H. Lamphear, Independence, aged 92, died at Marion Stations, in June.

Dr. J. H. English, Flat River, died July 12 from Bright's disease.

Dr. Wm. M. Bayliss, St. Louis, aged 71, died recently.

NORTH CAROLINA

The medical library of fifty-two volumes belonging to Capt. John Edwin Ray, Jr., who was wounded in the battle of Bellicourt and died in October, 1918, has been given to the library of the University of North Carolina by his mother.

Dr. Charles E. Lyday, Gastonia, and Miss Naomi Davie Pool, Kinston, were married June 28.

(Continued on page 46)

DOCTOR: Write or Wire
Ambulatory Pneumatic Splint Mfg. Co.
ATLAS BLOCK, CHICAGO

RESULTS COUNT FRACTURES

Hip, Thigh or Leg Set. Splints Rented Ready to Apply. Your Treatment of Patients, In or Out of Bed, Secures Good Bone Union, Comfort, Strength and Health in the Least Time with the Ambulatory Pneumatic Splint.

Specify it and our "Ambumatic" Washable Abdominal Supporters.

Adjustable for uplift or Binder, to any part of abdomen. Once used always prescribed.

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Our Departments of Physics and Medicine give instruction in the physics and therapeutic application of Radium.

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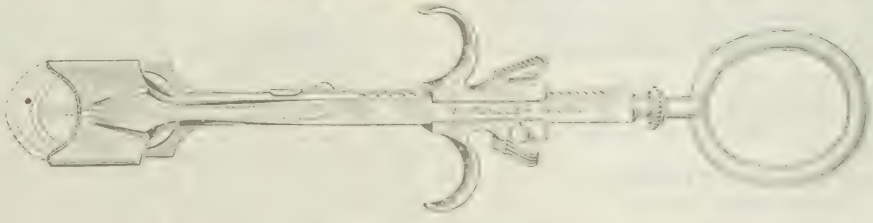
THE SEARCY TONSILLECTOME



A new instrument which combines all the advantages of the guillotine with the ecraseur action of the snare. By means of the crusher, slowly applied, there is a minimum of hemorrhage.

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CLINICAL LABORATORY OF
DR. ARTHUR C. KELLEY
Atlanta Georgia

Pathological Bacteriological
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"It Works Like a Charm"

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A 196 page bound work, pocket size, for instant consultation, giving valuable clinical and practical standards of work bringing therapeutic results and a wider range of practice alike and abreast.

Compiled exclusively for the medical profession, and distributed without cost by the Thompson-Plaster Co. it is ESSENTIAL to ask for it on your letter head.

THOMPSON-PLASTER CO.
LEESBURG, VIRGINIA

Continued from page 44

Dr. Claude Squires, Charlotte, and Miss Maude Shute, Monroe, were married July 5.
Dr. O. L. Pegram, Asheboro, and Miss Helen Corinne Bowie, Richmond, Va., were married July 6.
Dr. William S. Warthen and Miss Christine Gower, both of Clayton, were married June 29.

Deaths

Dr. John B. Elliott, St. Richlands, aged 70, died June 27.
Dr. E. S. Watkins, Morganton, aged 67, died July 4.
Dr. R. M. Davis, Bryson City, died at the home of his daughter in Sweetwater, Tennessee, July 7.
Dr. Andrew Jackson Smith, Turner, aged 81, died June 20.
Dr. Oscar Elston Goldfinch, aged 47, died June 26.
Dr. Richard James Mainwaring, aged 94, died July 30.

OKLAHOMA

Drs. M. F. Steiner, Leon Simon and P. O. Smith, announce the opening of their Diagnostic-X-Ray-Radium Complete Clinical Laboratory at Tulsa.
Dr. J. B. Wagstaff, Claremore, has been appointed Health Officer for Rogers County.
Plans have been submitted for a $70,000 city hospital in Purcell, Okla.
Dr. Glenn Francisco Reed, has been appointed Superintendent of Health for Garfield County, succeeding Dr. Warren McKenzie, resigned.
Dr. W. S. Cheney, Alva, has purchased a building in that city for the purpose of establishing a hospital.
Dr. J. S. Fleming, Alva, and Miss Artie Bram, McAlester were married May 18.

Deaths

Dr. James Foster Means, Claremore, aged 55, died July 9 from asthma.
Dr. William A. Amis, Mercer, aged 71, died June 1 from cancer of the stomach.
Dr. O. Leth, Arapaho, died July 25.
Dr. Joseph Henry Jansing, Cushing, aged 47, died July 14 in Oklahoma City.

SOUTH CAROLINA

Dr. Kenneth M. Lynch, Professor of Pathology of the Medical College of the State of South Carolina, Charleston, has resigned from the faculty and is connected with a group clinic at Dallas, Texas.

Deaths

Dr. Thomas J. Earle, Greenville, aged 76, died June 30.
Dr. Lawton C. Lipscomb, Ninety Six, aged 56, died July 8.

TENNESSEE

Drs. W. B. Wallace and Wm. G. Somerville have opened the Wallace-Somerville Sanitarium, Memphis, succeeding the Fisher-Wallace Sanitarium, for the treatment of nervous and mental disorders, alcoholism and drug addictions.
Dr. Walter C. Rucks, formerly Medical Director of Blue Ridge Sanatorium, Charlottesville, Va. has taken charge of the National Sanatorium for tuberculous ex-soldiers at Johnson City.
Drs. Charles J. Douglas and G. E. Campbell, Johnson City, have formed a partnership with offices in the Kress Building, Practice limited to the eye, ear, nose and throat.
The Doctors Building, Nashville, on Church Street, has been officially transferred to the Board of Missions of the M. E. Church, South, the purchase price being $361,000. The name will be changed to Century Building. Work on

Continued on page 48

The 'Rondack Recliner

A chair for the comfort of invalids and convalescents. Used and endorsed by United States Government, Saranac Lake Sanitariums, and institutions for the treatment of tuberculosis.

Frame is made of selected hardwood and equipped with ball-bearing casters. Head cushion adjusted to five positions of recline. Foot cushion has a double hinge action, permitting it to be used as a leg rest or as a foot rest. Reclining back is easily adjusted to eleven positions. The patient when adjusting adds much to comfort by changing the cushion from head to foot.

Price complete, with tufted cotton felt cushion, fully assembled, only prepaid $34.00
With cushion of Para Rubber 37.00
Patented Rest Adjuster extra 5.00

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To The Medical Profession

The Ethical and Scientific policies of the National Pathological Laboratories, wherever they are situated, are subject to the action of an Advisory Board composed as follows:

DR. OTTO FOLIN
Professor of Biological Chemistry, Harvard Medical School, Boston

DR. LOUIS HEKTOEN
Director John McCormick Institute for Infectious Diseases, Chicago

The members of this Board, while not directly connected with the control of the individual laboratories, will, however, specify the methods to be used and keep the laboratories in touch with the most modern advances that will be useful in making the laboratory examinations and may be called upon to interpret results when any doubt exists.

Problems relating to the application of laboratory methods to clinical medicine will be referred to Dr. Dock; Dr. Folin's advice will be followed in questions of blood chemistry and other biochemical questions relating to kidney diagnosis, and Dr. Hektoen's judgment in serology will be referred to Dr. Hektoen.

Ethical questions will be referred to all members of the Board and its action will determine the policies of the various laboratories.

NATIONAL PATHOLOGICAL LABORATORIES (Inc.)
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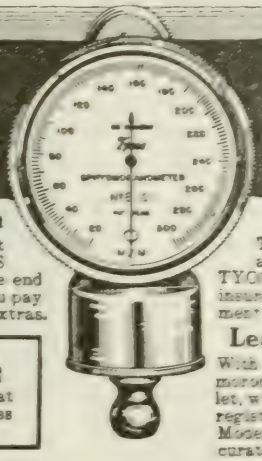
NEW YORK: 18 East 41st St. DETROIT: 910 Peter Smith Bldg. ST. LOUIS: University Club Bldg.

RENT THIS TYCOS NINE MONTHS THEN IT'S YOURS



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$2.50 Cash With Order Brings It. We will send it to you upon receipt of only $2.50 and allow you ten days free trial. If then you wish to keep it, simply pay the balance, $22.50, in nine small monthly payments of $2.50, and the instrument is yours. You cannot buy it for less anywhere else. You cannot buy it on such easy terms except by the Aloe Easy Rental Purchase Plan.

Ten Days Free Trial Just enclose first month's rent—$2.50 and we will send the TYCOS at once. Try it thoroughly for ten days. Give it every test you can. If you are willing to part with it, send it back at our expense and get your money. If pleased, then pay only $2.50 a month for 9 months. SEND FOR YOUR TYCOS TODAY. Do it NOW. Let it PROVE its usefulness to you. It is so easy to own that you'll never miss the money.

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Obviates many of the difficulties that are generally connected with the prescribed feeding of infants.

Easily prepared to meet the changing needs of the individual infant.

Very reliable—prescribed by the medical profession for over one-third of a century.

AVOID IMITATIONS

Samples and printed matter prepaid

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Medication for Hypodermic Treatment

Sterile, Accurate, Efficient. In Hypule Form

Sodium Cacodylate, Mercury Biniodide, Mercury Salicylate, Iron Citrate, Iron Citrate and Sodium Arsenate, Emetine Hydrochloride, Fisher's Solution (concentrated), Gray Oil, Novocain and 80 other formulae.

Heisters Hypules

These hypules not only insure full potency and exact dosage of the drug to be administered, but they afford the physician an aseptic, and readily assimilated solution or suspension. For treatment in serious and malignant diseases, hypodermic medication is far superior to the indirect methods of absorption through the alimentary tract. The use of HEISTER'S HYPULES places this form of medication on a scientific basis, relieving the practitioner of all anxiety as to the quantity or character of the hypodermic injection which he administers.

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From the Laboratory of

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Manufacturers of Physician's Pharmaceutical Specialties in Hypule Form

List on Application **CINCINNATI, OHIO, U.S.A.**

(Continued from page 16)

the addition of three stories to the building will begin soon, the cost of which will be over $200,000.

Dr. N. C. Harrub, of the State Board of Health, Nashville, has been appointed head of the new department of sanitary engineering.

Dr. George C. Paschall and Miss Bessie Lee Wilson, both of Franklin, were married June 30.

Dr. Henry L. Douglass and Miss Dorothy Lindsley, both of Nashville, were married June 22.

Deaths

Dr. Reuben Saunders Toombs, Memphis, aged 77, died July 15 in a sanatorium at Lexington, Ky.

Dr. Oscar Eskew, Lebanon, aged 46, died July 1 from tuberculosis.

Dr. James S. Washington, Somerville, aged 83, died June 30 after an illness of two weeks.

Dr. Henri A. Blakemore, Gallatin, aged 80, died July 3 from senile cirrhosis.

Dr. James R. Carroll, Henderson, aged 69, died June 29.

Dr. Samuel C. Sims, Memphis, aged 59, died July 14, following a long illness.

Dr. Orville C. Omohundro, Nashville, aged 76, died July 15 from heart disease.

Dr. James S. Rawlins, Dancyville, aged 74, died July 27.

Dr. P. D. Houston, Lewisburg, aged 79, died August 2.

Dr. L. Lewis, Sweetwater, died July 7.

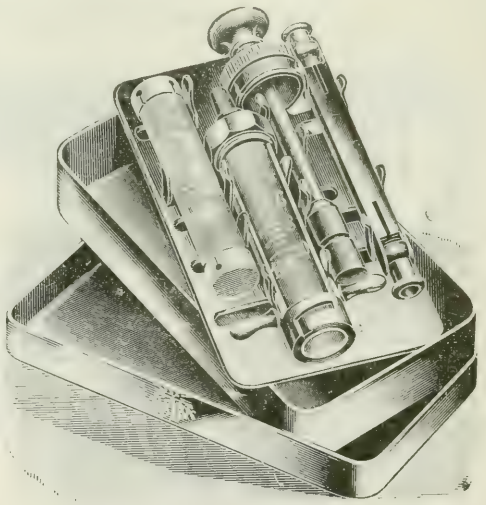
TEXAS

The William Beaumont General Hospital, El Paso, was opened June 15, with 230 patients, a medical army personnel of twelve officers, twenty-seven nurses and 173 enlisted men. The hospital has a bed capacity of 400.

Mrs. J. S. McMillan, manager of the Ennis Hospital, Ennis, announces that she will organize a stock company and

(Continued on page 50)

The Astra Syringe



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A vast amount of research work and a great number of clinical tests have enabled us to improve upon and bring it up to its present high state of efficiency where it remains—still without a peer.

It provides a convenient and very powerful apparatus for the application of intense ultra-violet rays to most manifestations of tuberculosis; superficial skin lesions, post-operative infections, nervous disorders, osteomylitis, ulcers and wounds, and conditions resulting from faulty metabolism.

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Twenty-three years of experience and prestige gives us access to unlimited facilities for specialized service. Infinite and constant research, painstaking accuracy, and intimate knowledge of all phases of the duties to be performed for a client of this organization, and a cherished reputation to uphold, all converge to the expenditure of our best efforts to merit the confidence placed in us by the profession.

For Medical Protective Service
Have a Medical Protective Contract

The Medical Protective Co.

Fort Wayne, Indiana

(Continued from page 48)

will erect the first unit of a modern hospital north of Ennis.

At the recent annual meeting of the Texas Pharmaceutical Association held in San Antonio, the following officers were elected: Arthur Skillern, Dallas, President; William Collins, Amarillo, First Vice-President; W. H. Wentland, Manor, Second Vice-President; W. H. Cousins Dallas, Secretary-Treasurer.

Doctors of Dallas have purchased a site at Live Oak and Pearl Streets for $45,000 and will construct a building to be used exclusively by doctors and dentists. Funds for the buildings have been raised by the doctors and dentists who will occupy the building.

An appropriation of $100,000 by the Carnegie Foundation has been announced by the National Board of Medical Examiners for its use during a five year period to establish a national standard of examination and certification of graduates in medicine.

Dr. Kent V. Kibbie, Fort Worth, has been selected to succeed Dr. S. A. Woodward as a member of the City Health Board.

Construction of the nurses' home at Parkland Hospital, Dallas, will cost more than $100,000.

Dr. Joseph Newton Sisk, Fort Worth, and Miss Elizabeth M. Reed, Dallas, were married July 3.

Dr. Clarence Axtell Penman and Miss Annie Elizabeth Lanier, both of Beaumont, were married at Houston, June 29.

Dr. Michael A. Dailey, Major, M. C. U. S. Army, Marfa, and Miss Joeen Margaret O'Brien, Paris, were married June 25.

Deaths

Dr. B. H. Rand, Golden, died June 13 from acute indigestion complicating malarial infection.

Dr. Henry North Graves, Dallas, aged 75, died June 28.

Dr. Paul A. Ramsel, Shiner, aged 46, died July 9.

Dr. John T. Seale, Neches, aged 59, died June 26 after an illness of two months.

Dr. J. A. Cozby, Fort Worth, aged 60, died July 30, from hemorrhage of the brain.

Dr. John Turner Roberts, Kountze, aged 33, died June 27, following an operation.

Dr. J. K. P. Green, Nixon, aged 76, died July 18 from apoplexy.

VIRGINIA

Dr. Walter C. Klotz, Medical Director of Blue Ridge Sanatorium, Charlottesville, has resigned and taken charge of the National Sanatorium for tuberculous ex-soldiers at Johnson City, Tenn.

The Fredericksburg Medical Society has elected the following officers: Dr. Roderick Dew, Woodford, President; Dr. F. C. Pratt, Fredericksburg, Vice-President; Dr. J. N. Barney, Fredericksburg, Secretary-Treasurer.

The medical supply depot at Camp Lee was destroyed by fire August 4. Government officials estimate the loss at $50,000.

At the organization meeting of the Albemarle County Fair Association in June, Dr. Louis G. Roberts, Moormans River, was elected one of the directors.

(Continued on page 52)

CLASSIFIED ADVERTISEMENTS

GRADUATE NURSE WANTED for eighteen months' course in hospital laboratory. Diploma as graduate technician granted at end of course. Address Dr. Walter C. Jones, St. Vincent's Hospital, Birmingham, Ala.

GUINEA PIGS AND HUTCHES—Strong, healthy laboratory stock, 8 to 10 ounces, 90c; 12 to 14 ounces, $1.10; 16 to 20 ounces, $1.25, prepaid. No orders less than six. Five complete three compartment hutches $5.00 prepaid, worth double. E. L. Harris, 1526 East Main St., Chattanooga, Tenn.

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A Temporary Diet in Summer Diarrhea

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Water (boiled, then cooled) **. 16 fluidounces**
To be given in small amounts at frequent intervals.

Each ounce of this mixture has a food value of 6.2 Calories and furnishes immediately available nutrition well suited to spare the body-protein, to prevent a rapid loss of weight, to resist the activity of putrefactive bacteria, and to favor a retention of fluids and salts in the body tissues.

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G. H. SHERMAN, M. D.
Detroit, Mich. U. S. A.

"Sherman's Vaccines are dependable Antigens."

(Continued from page 50)

Dr. E. Leavenworth McGill, Petersburg, and Miss Patty Radcliffe Fitts, Wilmington, N. C., were married June 28.

Dr. George G. Snarr and Miss Reba Beard, both of Harrisonburg, were married June 29.

Dr. John Stuart Hume, Norfolk, and Miss Isabel Hamilton Christian, Lexington, were married June 4.

Dr. William Wirt Waddell, Jr., Norton, and Miss Barbara Belle Flock, Williamsport, Pa., were married June 14.

Dr. Campbell Harris and Miss Winifred Gertrude Gwynne, both of Richmond, were married June 3.

Dr. Allen Tupper Hawthorne, Harrisonburg, and Miss Dorothy Turner, Afton, were married June 2.

Dr. Everett Russell Ferguson, Toms Creek, and Miss Amalia Brizzie, Chattanooga, Tenn., were married June 22.

Dr. Richard Hugh Wood, Richmond, and Miss Maria Booth Robinson, King William, were married June 18.

Deaths

Dr. V. C. Huff, Wytheville, aged 87, died July 19.

Dr. Logan Lindsay Banner, Castlewood, aged 63, died June 29 from general paresis.

Dr. John F. Wright, Keezeltown, aged 68, died June 26.

WEST VIRGINIA

Dr. G. H. Barksdale, Charlestown, President of the West Virginia Tuberculosis Association, has been elected a member of the Board of Directors of the National Tuberculosis Association.

Dr. L. H. McCuskey, Moundsville, has resigned as County Health Officer for Marshall County, in order to give more time to his practice.

At the reorganization meeting of the Seventh District Medical Association, composed of the Counties of Sumter, Williamsburg, Clarendon, Lee and Georgetown, at Sumter July 7, the following officers were elected: Dr. J. A. Mood, President; one Vice-President from each county; Dr. Carl B. Epps, Secretary-Treasurer.

Dr. Quintus Harper Barney and Miss Nell Richard Files, both of Wardensville, were married June 25.

Deaths

Dr. Will J. Davidson, Parkersburg, died July 12 from blood poisoning.

Dr. Robert L. Brown, Parkersburg, aged 67, died July 25 from heart disease.

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DIPHTHERIA TOXIN-ANTITOXIN MIXTURE (Diphtheria Prophylactic) is a mixture of Diphtheria Toxin and Antitoxin prepared according to directions laid down by Von Behring, Park and others.

Indications for use:

1. For general prophylaxis against diphtheria in schools and communities, excluding immediate contacts.

2. For permanent immunity against infection for individuals not recently exposed.

3. In conjunction with a prophylactic dose of diphtheria antitoxin for those who are exposed to diphtheria and desire a longer protection than would result from antitoxin alone.

Contra-indications: (1) It should never be used as a treatment for diphtheria. (2) It should never be used as an immunizing agent for an individual recently exposed, unless a prophylactic dose of diphtheria antitoxin is given at the same time.

Diphtheria Toxin-Antitoxin Mixture (Diphtheria Prophylactic) is given in three subcutaneous injections of one cubic centimeter each, at intervals of about five days. It is supplied in cases of three 1-cc bulbs, without injecting attachment.

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